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**Tissue Concentrations of Elemental
and Organochlorine Compounds in Sea Otters in Alaska**

by
Linda R. Comerci, Marine Mammals Management Office
Alaska, Region 7

Carol S. Gorbics, Carlsbad Fish and Wildlife Office, Environmental Contaminants
California, Region 1

Angela C. Matz, Northern Alaska Ecological Services Office
Alaska, Region 7

and

Kimberly A. Trust, Anchorage Field Office, Environmental Contaminants
Alaska, Region 7

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ABSTRACT

Sea otters (*Enhydra lutris*) are found in coastal waters of Alaska from the southeast part of the state through the Aleutian Islands. Sea otters and their principle prey, benthic invertebrates, are comparatively sedentary; therefore, studying contaminant exposure in sea otters provides an opportunity to examine large-scale spatial variation in contamination of the nearshore environment. The U.S. Fish and Wildlife Service obtained tissue samples primarily from subsistence harvested animals taken by Alaska Natives that were provided to the Sea Otter Biosampling Program, a joint effort of the Service and the Alaska Sea Otter and Steller Sea Lion Commission. Samples were grouped into the following three geographic areas: southeast Alaska including Yakutat Bay; southcentral Alaska including Prince William Sound and Cook Inlet; and southwest Alaska through the Aleutian Islands, including the Kodiak Archipelago.

Sea otter liver and kidney tissues were analyzed for a suite of trace elements/metals and organochlorines, including polychlorinated biphenyls (PCBs). Summary and comparative statistics were performed with parametric and nonparametric statistical tests, depending on the percent of each analyte detected in each group. Overall, sea otter tissues from southcentral Alaska had higher concentrations of select metals and trace elements when compared to the other geographic areas. Organochlorine pesticides were either not detected or were detected at low concentrations in most otters, with only beta-BHC occurring in enough samples to warrant a statistical evaluation. A few individual animals had elevated concentrations of PCB Aroclors, indicating that PCB contamination may be present in localized areas. However, for most samples in which contaminants were detected, levels were below biologically significant levels. The general pattern of contamination among groups was southcentral > southwest > southeast.

INTRODUCTION

Sea otters (*Enhydra lutris*) are found in coastal waters of Alaska from the southeast part of the state through Prince William Sound, areas of lower Cook Inlet, Kodiak Island, the Alaska Peninsula and the Aleutian Islands. Typically, they inhabit protected waters, including intertidal and subtidal areas up to an approximate depth of 40 meters, areas where they predominantly feed (Riedman and Estes, 1990). Therefore, the presence of contaminants in their tissues may be indicative of contamination throughout the food web of the nearshore environment. The relatively high trophic status of this mustelid species makes them vulnerable to persistent and bioaccumulating contaminants. Sea otters and their principle prey, benthic invertebrates, are also comparatively sedentary; thus, any contaminant uptake may be reflective of local environments. Studying contaminant exposure in sea otters provides an opportunity to examine broad-scale spatial variation in contamination in nearshore environments.

High levels of polychlorinated biphenyls (PCBs) and dichlorodiphenyltrichloroethane (DDT) have been found in sea otter tissues collected near military installations in the Aleutians, whereas concentrations were low or undetectable in sea otters from southeast Alaska (Bacon, 1994; Giger and Trust, 1997; Estes *et al.*, 1996). Metal and trace elements were also measured in these otters and results showed elevated concentrations of cadmium and selenium in older sea otters, when compared to juveniles (Giger and Trust, 1997). Sources of elevated cadmium and selenium are unknown but could be from anthropogenic or natural sources. Low lead concentrations have been documented in the teeth of sea otters from Amchitka Island in the Aleutian Island chain (Smith *et al.*, 1990). Elevated concentrations of potentially toxic metals have been found in the tissues of other Alaskan marine mammals (Goldblatt and Anthony, 1983; Warburton and Seagars, 1993; O'Shea, 1999).

Organochlorine compounds are toxic to many organisms, including mammals, and are of concern because they are persistent and bioaccumulate (Connel, 1990). For example, PCBs have been shown to cause reproductive failure at low concentrations in another mustelid species, American mink (*Mustela vison*) (Aulerich *et al.*, 1973; Platonow and Karstad, 1973); however, the potential effect of similar PCB concentrations in sea otters is unknown.

The purpose of this study was to document concentrations of organochlorine and elemental contaminants in sea otter tissues from locations throughout Alaska including Prince William Sound, southeast Alaska, Cook Inlet, Kodiak Island, Yakutat, Alaska Peninsula, and the Aleutian

Islands, and from two sea otters from Russia. We also compared contaminant concentrations among three major geographic groupings in Alaska (southwest, southcentral and southeast Alaska), and compared our results to other data reported for sea otters, mustelids and marine mammals.

METHODS

Most of the sea otter tissue samples (sea otter livers and kidneys) used in this study were provided to the U.S. Fish and Wildlife Service (Service) from subsistence harvested animals taken by Alaska Natives and provided to the Sea Otter Biosampling Program. This program is a joint effort of the Service and the Alaska Sea Otter and Steller Sea Lion Commission (TASSC), a statewide Native non-profit group dedicated to tribal participation in marine mammal management. The program provided training on sample collecting and handling as well as logistical arrangements for sample transport and storage. Additional samples were from beachcast carcasses collected by Service personnel. A standardized data collection protocol was used for all samples (Doroff and Mulcahy, 1997). Basic biological data for each animal were also collected, and these data remain on file with the Service and TASSC in the Sea Otter Biosampling Database.

Field Collection

Samples were collected from locations across coastal Alaska (Table 1, Figure 1). Subsistence hunters provided fresh carcasses to a local Native biosampler. The biosampler excised whole organs from the animal minimizing potential sources of contamination found in the field, such as smoke, exhaust, or fuel. A pre-molar tooth was pulled from all animals for aging. The organs were placed in a sealed plastic bag, immediately frozen, and then shipped frozen to the Service laboratory in Anchorage, Alaska. Alternatively, entire carcasses were chilled or frozen and shipped directly to this laboratory. Samples from beachcast sea otter carcasses were collected by Service personnel from intact frozen carcasses provided by several sources including National Wildlife Refuge personnel and the Alaska Sealife Center. These samples or carcasses were also shipped chilled or frozen to the Service laboratory.

Upon receipt at the laboratory, tissues were stored at -40° C. A core subsample of each organ (approximately 50 grams) was obtained using clean techniques as follows. Organs were thawed to a semi-frozen state, and tissue samples were taken using acid/acetone washed dissection tools and sterile stainless steel scalpel blades on Teflon lab surface sheeting. Samples were placed in

pre-cleaned glass jars (I-CHEM 300) and shipped frozen to independent analytical laboratories through the Service's Division of Environmental Contaminants.

This report includes samples from 68 animals analyzed through the Service's Marine Mammals Management and Environmental Contaminants programs between 1993 and 1999. Appendix A lists samples according to their submission by "catalog", a group of like samples submitted at the same time to the same laboratory. Results from one catalog (Catalog 7020043) have previously been reported (Giger and Trust, 1997), but are included to enhance statewide comparisons.

Laboratory Methods

Detailed analytical methods for both organochlorine and metal analyses are available from Patuxent Analytical Control Facility (PACF), Patuxent Wildlife Research Center, U.S. Fish and Wildlife Service, Laurel, Maryland. Organochlorine and PCB samples were analyzed at Mississippi State Chemical Laboratory in Mississippi State, Mississippi. Livers and kidneys were analyzed for the following organic compounds: hexachlorobenzene (HCB), alpha-betabenzenehexachloride (alpha-BHC), alpha chlordane, beta BHC, cis-nonachlor, delta BHC, dieldrin, endrin, gamma BHC, gamma chlordane, heptachlor epoxide, mirex, ortho-para-dichlorodiphenylchloroethane (o, p'-DDD), o,p'-dichlorodiphenylethylene, (o,p'-DDE), o,p'-dichlorodiphenyltrichloroethane (o,p'-DDT), oxychordane, p,p'-DDD, p,p'-DDE, p,p'-DDT, toxaphene, trans-nonachlor, and PCBs (analyzed as follows: Total PCBs as an Aroclor sum, specific congeners, and Aroclors 1242, 1248, 1254, and 1260). PCBs were measured as described above, however individual PCB analyses varied among catalogs. Samples from five sea otters (Catalog 7020030) were analyzed for organochlorine pesticides and Total PCBs using EPA Micromethod B (600/8-80-038). Analyses of the remainder of samples was done by accelerated solvent extraction, gel permeation chromatography and florsil cleanup, and electron capture gas chromatography. PCB congener analyses were confirmed with mass spectrometer for Catalogs 7020048 and 7020054.

Elemental analyses were performed by Research Triangle Institute in Research Triangle Park, North Carolina (Catalogs 7010024 and 7020030) and the Geochemical & Environmental Research Group, Texas A&M University, Texas (Catalogs 7020043, 7020048, and 7020054). Livers and kidneys were analyzed for the following analytes: aluminum (Al), arsenic (As), barium (Ba), beryllium (Be), boron (B), cadmium (Cd), chromium (Cr), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), mercury (Hg), molybdenum (Mo), nickel (Ni), selenium (Se), strontium (Sr), vanadium (V), and zinc (Zn). All metals, with the exception of

mercury, were analyzed using graphite furnace atomic absorption spectrometry or inductively coupled plasma (ICP) emission measurement following nitric acid reduction. Mercury was analyzed by cold vapor atomic absorption spectrometry with tin chloride reduction. Methylmercury was not included in the analyses.

Quality Assurance/Quality Control (QA/QC)

Quality assurance and quality control followed PACF contractual guidelines and the data were also reviewed for acceptance relative to QA/QC guidelines established at the USFWS Northern Alaska Ecological Services Environmental Contaminants Office (Quakenbush and Snyder-Conn, 1993; K. Mueller, pers. comm.). Ten percent of the samples were screened for analytical accuracy and precision. For accuracy, an average spike recovery between 80-120% was considered acceptable. For precision, an average relative percent difference was calculated based on a comparison of duplicates and was considered acceptable if the average RPD was <20% ($RPD = ([D1-D2]/[(D1+D2)/2] * 100$, where D1 = the concentration measured in the first analysis, and D2 = the concentration measured in the second analysis). For procedural blanks, a concentration <15% of the mean sample concentration was considered acceptable. Analytes that failed to meet QA/QC criteria were not included in further analyses and are not presented in this report. A standard reference material (homogenate whale blubber, ARM 1945), obtained through the Standard Reference Material Program, National Institute of Standards and Technology, was included in the analyses for quality assurance purposes.

Laboratory method detection limits were consistent for all non-PCB organochlorines. However, the detection limits for some metals and PCB congeners were changed from the time of the earlier sample analyses (Catalog 7020043) compared to the more recently submitted samples (Catalog 7020048 and 7020054). QA/QC parameters for aluminum were not met in Catalog 7020043. Although average percent recovery within the standard reference material was 79% (below the acceptable 80%) for mercury in Catalog 7020043, we used these data since all other QA/QC parameters were met. The following organochlorine analytes did not meet QA/QC parameters for some portion of samples analyzed: p,p'-DDE, delta BHC, p,p'-DDE, Aroclor 1254, and PCB congeners 28, 189, 10, 16, 20/23, 8, 167, 74/88, 126, 158, and 81. HCB did not meet QA/QC parameters for any of the samples submitted; and therefore, it was not included in our data analyses. Appendix A provides specific details regarding the QA/QC review.

Data Analyses

We used descriptive statistics (percent detections, geometric mean, and range) to summarize the data, and tested for differences among geographic areas or groups: (a) southeast Alaska including Yakutat Bay; (b) southcentral Alaska including Prince William Sound and Cook Inlet; and (c) southwest Alaska including the Aleutian Islands, the Alaska Peninsula and Kodiak Archipelago (Table 1). Comparisons among groups depended upon a certain percentage of detections within each group. No statistical tests were performed on those analytes detected in <10% of samples in any group; non-parametric (univariate Kruskal-Wallis rank sum) tests were used to compare groups in which the specific analyte was detected in >10% and < 90% of samples in each group; and parametric testing was used to compare groups where analytes were detected in >90% of the samples in each group (with non-detections substituted with $\frac{1}{2}$ the detection limit). For parametric analyses, data were log-transformed to achieve normality and stabilize variance. When analytes were correlated, we used principal components analysis (PCA) as a method of variable reduction. If PCA cleanly separated the multiple analytes into a few principal components that were easily interpreted, we tested the factor scores from these principal components for differences among groups. If PCA did not cleanly reduce the analytes to a few variables, we used Multiple Analysis of Variance (MANOVA), retaining all variables with univariate p-values < 0.15, to test for group differences. MANOVA was used to reduce the experiment-wise error associated with a high number of correlated variables. Significant differences between specific groups in individual analytes were determined with univariate ANOVAs and Bonferroni-adjusted post-hoc comparisons. We used SYSTAT 8.0 or 9.0 for all analyses.

RESULTS

Analytical results are presented in parts per million (ppm) or parts per billion (ppb) on a dry weight (dw) basis, unless otherwise specified. Percent detections (percent of samples in each geographic group that exceeded detection limits for each analyte) were calculated for all analytes. The range of contaminant concentrations are presented for each analyte by group, however geometric means were calculated only for those analytes where residues were detected in at least 50% of the samples. When calculating means, values below the detection limit were substituted with $\frac{1}{2}$ the detection limit. Only the detected values were used to determine ranges. Elemental, organochlorine and PCB congener summary statistics are presented in Tables 2, 3 and 4, respectively. Complete analytical results for individual tissues are presented in Appendix B through F.

Elemental Residues

There were few or no detections of Al, B, Ba, Be, Cr, Mo, Ni, and Pb in liver tissue samples (Table 2, Appendix B), and few detections of Al, B, Ba, Be, Cr, Mo, Pb and Sr in kidney tissue samples (Table 2, Appendix C). These analytes were not tested for group differences. Non-parametric analyses were used to test for group differences in As and V in livers, and Ni and V in kidneys, since these analytes were detected in >10% but <90% of samples in each group. There were no significant differences among groups for V in liver and kidney (Kruskal-Wallis test statistic = 0.091, 1.748; P = 0.956, 0.417, df = 2, 2, respectively), or Ni in kidney (Kruskal-Wallis test statistic = 0.538, P = 0.764, df = 2). There were significant differences among groups for As in liver, with the mean rank sum from the southcentral group being significantly higher than the southeast or southwest groups, and the highest median value found in the southcentral group (Figure 2).

Analytes that were detected in > 90% of samples included As (kidney only), Cd, Cu, Fe, Hg, Mg, Mn, Se, and Zn. In livers, Cu, Fe, Hg, Mn, Se, and Zn contributed to significant multivariate differences among groups (Wilks' λ = 0.494, $F_{12, 116}$ = 4.089, P < 0.001), with univariate P-values of 0.020, 0.016, <0.001, 0.022, <0.001, and 0.048, respectively. In kidneys, only Cu, Hg, and Se contributed significantly to the final multivariate model (Wilks' λ = 0.776, $F_{6, 108}$ = 2.432, P = 0.030), with univariate P-values of 0.128, 0.020, and 0.065, respectively. Mercury was significantly greater in the southcentral group compared to southeast, but neither the southeast nor southcentral concentrations were significantly different from the southwest group. Concentrations of all of these metals in both tissues were greater in the southcentral group when compared to the southeast and southwest groups (Table 5). All analytes included in the final models were positively correlated with each other in livers (uncorrected Pearson correlation, all P < 0.05), except Fe and Mn; and kidneys (uncorrected Pearson correlation, all P-values < 0.05).

Organochlorine Residues

In both liver and kidneys, there were no detections of alpha-BHC, alpha-chlordane, delta-BHC, endrin, gamma-BHC, gamma-chlordane, HCB, mirex, o,p'-DDD, o,p'-DDE, o,p'-DDT, and toxaphene (Table 3, Appendices D and E). Cis-nonachlor was not detected in kidney samples and was detected in only two liver samples (both from the southwest group). Dieldrin, heptachlor epoxide, p,p'-DDD, and trans-nonachlor were detected in only a few samples (all from the southwest group) and were not statistically analyzed for differences among groups.

Beta-BHC was detected in >10% of kidney samples (14%, 75%, and 60% for the southcentral, southwest, and southeast groups, respectively). There were significant differences among groups with the mean rank sum from the southcentral group being lower than southeast and southwest groups (Kruskal-Wallis test statistic = 13.107, df = 2, P = 0.002). Although the highest value occurred in a southcentral animal (0.184 ppm dw), the relatively few beta-BHC detections in the southcentral group compared to southwest and southeast resulted in a lower median value (Figure 3).

Polychlorinated biphenyl (PCB) Residues

A summary of the results of Total PCBs and PCB Aroclors is presented in Table 3 and a summary of specific PCB congener analyses is presented in Table 4. Appendices E and F present all PCB analytical results.

Although PCBs were measured in all samples, the specific chemical analyses varied among catalogs in both the selection of congeners and in detection limits. For example, congener-specific analysis occurred only in the most recent catalogs (7020043, 7020048 and 7020054) and different congeners, with higher detection limits, were measured in Catalog 7020043 compared to Catalog 7020048 and 7020054. Additionally, groups were not equally represented in all years, and some analytes failed QA/QC parameters in some catalogs, resulting in different sample size among groups. Because of these data inconsistencies, comparisons among groups were made only for analytes that were consistently measured with similar detection limits. This occurred for congeners 118, 126, 128, 138, 153, 156, 158, 169, 170, 31, 70, 77, and 81 in Catalogs 7020043 and 7020048, and Aroclors 1242, 1248, 1254, 1260 and Total PCBs as Aroclor sum in Catalogs 7010024, 7020043 and 7020048.

There were no detections of Aroclors 1242 and 1248 and few detections of Aroclors 1254, 1260, and Total PCBs (calculated as Aroclor sum) in either livers or kidneys, so these analytes were not statistically analyzed. However, some sea otters from certain sites in the Aleutian Islands had very high concentrations of Total PCBs, indicating that these otters may have been directly exposed to sites known to be contaminated from past military use (Table 6).

Congeners 126 and 169 in liver and kidney were detected in >10% but <50% of samples in one or more groups (Table 4). There were no significant differences among groups in these analytes (Kruskal-Wallis test, all P > 0.05) (Table 7). Analytes that were detected in >90% of samples in all groups included PCB congeners 118, 128, 138, 153, 156, 158, 170, 31, 70, 77, and 81. Many analytes were significantly correlated within livers and kidneys so PCA was employed to reduce

the number of variables.

In livers, the analytes clearly separated into two principal components, together accounting for 89.6% of the variability within the data set. PCB congeners 118, 128, 138, 153, 156, 158, and 170 were represented by the first principal component (absolute value of respective component loadings > 8.0) and 31, 70, 77, and 81 were represented by the second principal component. Using factor scores from the two principal components as response variables, we observed significant multivariate differences among the groups (Wilks' $\lambda = 0.67$, $F_{4,58} = 3.24$, $P = 0.018$) in the first but not the second principal component (univariate $F_{2,30} = 3.94$, $P = 0.03$ and $F_{2,30} = 2.12$, $P = 0.14$, respectively). Factor scores from the first principal component (and therefore the congeners represented by it) were higher in the southcentral group compared to southeast and southwest, but significantly higher only compared to southeast. The southwest group was not significantly different from either southcentral or southeast (Table 7).

In kidneys, congener concentrations did not cleanly separate into principal components, so analytes were tested for differences among groups using MANOVA with all analytes as response variables. The final model included PCB congeners 118, 128, 138, and 153 (univariate $P = 0.070, 0.070, 0.013$, and 0.055 , respectively), but there was not a significant multivariate difference among groups (Wilks' $\lambda = 0.67$, $F_{8,54} = 1.50$, $P = 0.178$). PCB 138, the only analyte with a univariate P -value below 0.05, appeared lower in southeast compared to the other groups.

The overall pattern observed for specific PCB congeners was higher concentrations in the southcentral group, followed by southwest and then southeast. When there were significant differences, tissues from the southcentral group always contained the highest levels of specific PCB congeners. This pattern is comparable to that observed for metals.

DISCUSSION

Our primary objectives were to provide a baseline assessment of sea otter tissue contaminant levels across the state of Alaska and to compare these levels across geographic groups. The analytes discussed below are important based on their potential toxicity or ones that were found in relatively high concentrations in our results. We discuss possible anthropogenic sources, toxicity data for mammals (either marine mammals or mustelids) including any target or protection levels, and comparisons with specific data from other sea otter studies when available. Data are discussed in the text in both dry weight (dw) and wet weight (ww) to facilitate comparisons with published values. Discussion of mean concentrations of these data indicate geometric mean unless otherwise noted.

Elemental Residues

Of the elements analyzed in this study, several metals are of interest relative to wildlife health, especially with respect to marine mammals. Many metals occur naturally in the Earth's crust and are ubiquitous in the environment. Some metals, such as Zn, Cu, Fe, and Se, are biologically essential, playing an integral role in biochemical systems necessary for life. Other metals, such as Pb, Cd, and Hg, do not appear to have any biological function in organisms and are known as non-essential metals. Only trace amounts of essential metals are required physiologically, and they become toxic at increased doses, as do non-essential metals. Animals have developed a variety of homeostatic mechanisms for the regulation of essential metals; therefore, toxic effects are less likely to be experienced with most of the essential metals, unless animals are acutely exposed to an exceptionally high dose (AMAP, 1998). Below we discuss concentrations of select metals from our study and potential implications to sea otter health.

Cadmium - Cadmium is a relatively rare, naturally occurring heavy metal and is not essential to life. It is found in small amounts in zinc ore and also soils of volcanic origin (Eisler, 1985a). Anthropogenic sources include its occurrence as byproducts of incineration of fossil fuels, smelting operations, electroplating, and production of batteries. Atmospheric transport may be an important source of cadmium in areas without direct sources (AMAP, 1998).

Eisler (1985a) summarized several trends for cadmium based on a review of available literature including the following: marine biota have significantly higher residues than freshwater biota; cadmium concentrates in the liver and kidneys of vertebrates (accumulating to a greater extent and to a relatively high concentration in kidney tissue of higher marine vertebrates); and levels of cadmium tend to be higher in older animals. It often is found in association with similar and correlated increases in zinc concentration (Fumess and Rainbow, 1990). Cadmium toxicity is generally found to be lower in marine waters, and this has been attributed to chloride complexation (AMAP, 1998). Cadmium is a known carcinogen, teratogen, and probable mutagen (Eisler, 1985a).

The mean concentrations of cadmium reported in our study were 5.31 ppm dw (1.48 ppm ww) in sea otter liver samples, and 18.7 ppm dw (5.24 ppm ww) in kidney samples. Cadmium residues in vertebrate kidney or liver that exceed 10 ppm ww is evidence of contamination, and residues of 20 ppm in kidney are probably life-threatening to the organism (Eisler, 1985a). An effects threshold level for cadmium in marine mammals is 20-200 ppm ww in livers and 50-400 ppm ww in kidneys, with renal dysfunction as the endpoint (Law, 1996). Cadmium levels in sea otter kidneys have been reported as 89-300 ppm dw (Eisler, 1985a). Cadmium concentrations in

European otters (*Lutra lutra*) from the Orkney Islands, Scotland, a relatively clean area, were generally low with liver levels ranging from non-detectable to 0.39 ppm ww, and kidney concentrations between 0.8 and 0.56 ppm ww (Mason and Reynolds, 1988).

Mercury - Elemental mercury (and its organic forms) have no known role in biological processes of organisms and represent a potentially toxic compound when taken up by animals. Global levels of mercury have increased since the industrial age due to increased anthropogenic output from the pharmaceutical, electrical, mining, pulp and paper, and instrument manufacturing industries (Eisler, 1987). However, much of the mercury in the environment is unavailable to organisms, because it strongly binds to sediment or organic material. Inorganic forms can be methylated by microorganisms and transformed to methylmercury, which is then more readily taken up and accumulated in both aquatic and terrestrial organisms. Organic forms of mercury are generally more toxic than inorganic forms in these organisms (AMAP, 1998). Because much of the mercury in marine mammal tissues is largely inorganic as opposed to the organic form found in their prey, it has been suggested that a detoxification mechanism for mercury may exist in top level marine predators (Furness and Rainbow, 1990).

In marine mammals, the liver generally accumulates the highest concentration of mercury, followed by kidney and muscle. Liver mercury tends to be in the inorganic form, whereas muscle mercury is in the organic form. Similar to cadmium, tissue concentrations of mercury increases with age in marine mammals. Mercury levels tend to be a reflection of dietary levels in prey. For example, fish eating species such as pinnipeds, tend to have relatively high mercury concentrations, while species such as walrus (*Odobenus rosmarus*), that feed on benthic invertebrates, tend to have relatively low mercury levels (Furness and Rainbow, 1990). In general, sea otters feed on benthic invertebrates with fish being an incidental part of their diet. Fish may constitute a more important role in the sea otter diet in those areas where otter populations have been established for long periods; such as has been documented in the Aleutian Islands (Riedman and Estes, 1990). Mink and river otter accumulated about tenfold more mercury than did predatory fish from the same drainage areas, suggesting that these species can serve as sensitive indicators of mercury, even at low levels of mercury contamination (Eisler, 1987).

In our study, mercury concentrations in sea otters were low with a mean of 1.55 ppm dw (0.43 ppm ww) in liver samples and 0.70 ppm dw (0.19 ppm ww) in kidney samples. European otters from the Orkney Islands, Scotland had mean tissue concentrations of 4.7 ppm ww in livers and a maximum of 3 ppm ww in kidneys (Mason and Reynolds, 1988). Mercury concentrations of 60 ppm ww is a reported effects threshold level for liver damage in marine mammals (Law,

1996). Tissue residues in the kidney in excess of 1.10 ppm wet weight in mammals is considered evidence of significant mercury contamination (Eisler, 1987).

Lead - Lead is considered a non-essential element. Anthropogenic sources of lead tend to enter the marine ecosystem in coastal areas adjacent to industrial activities. A review of several marine mammal studies showed concentrations of lead to be relatively low (< 1 ppm ww) in liver tissue (Law, 1996). Most mammal species show an age related accumulation of lead; however, no correlation between tissue lead concentrations and age was observed for northern fur seals (*Callorhinus ursinus*) in Alaska (Law, 1996).

Lead levels in sea otters in our study were low ranging from nondetectable levels to 1.67 ppm dw (0.52 ppm ww) in liver tissue, and from nondetectable levels to 0.99 ppm dw (0.30 ppm ww) in kidney tissue. European otters have had concentrations of lead ranging from 0.13 and 3.65 ppm ww in livers and 1.38 and 3.8 ppm ww in kidneys (Mason and Reynolds, 1988). An effects threshold level reported for lead is 30 ppm dw in liver and 90 ppm dw in kidney, while it is also noted that clinical signs of lead toxicosis in mammals appear to be associated with a range of concentrations of lead in the liver and kidneys at concentrations as low as 5 ppm dw in livers and 15 ppm dw in kidneys (Ma, 1996).

Arsenic - Arsenic is a relatively common element, present naturally in the environment and also present as a result of various industrial and agricultural activities. It is an essential element, although the nutritional requirements for marine mammals are unknown (Law, 1996). Arsenic concentrations in marine mammal tissues rarely exceed 1 ppm ww (Furness and Rainbow, 1990). In contrast, marine fish and invertebrates can contain high arsenic concentrations (up to 100 ppm); however, most of this is present in the form of organoarsenical compounds, which are relatively nontoxic and can be eliminated via the kidney in mammals (Law, 1996). Arsenic is bioconcentrated by organisms, but is not biomagnified in the food chain (Eisler, 1988). In our study, arsenic levels were low in sea otter livers and kidneys averaging 0.88 and 1.88 ppm dw (0.25 and 0.53 ppm ww), respectively.

Chromium - Chromium is an essential trace element in many animal species, but is considered a carcinogen, mutagen and teratogen at high levels. Chromium is used in a variety of industries, particularly metallurgy and chemical, and its anthropogenic sources greatly exceed any natural source (Eisler, 1986). Inorganic chromium compounds are poorly absorbed in animals regardless of dose and dietary status; hexavalent chromium is better absorbed and much more toxic (Law, 1996). Eisler (1986) states that tissue levels in excess of 4 ppm dw is presumptive evidence of contamination; however, the physiological significance of this level is unclear. He also states

that sensitivity to chromium varies widely among even closely related species. Chromium levels in the sea otters analyzed in our study ranged from nondetectable levels to 5.86 ppm dw (3.56 ppm ww) for livers and from nondetectable levels to 62.4 ppm dw (16.8 ppm ww) for kidneys.

Selenium - Selenium is ubiquitous in nature as its major source is natural weathering of rock. Anthropogenic sources, such as fossil fuel combustion, contribute to the overall amount of selenium in the environment; however, natural sources are the main contributor (Eisler, 1985b). Selenium is an essential element important for biological functions at certain levels, but toxic at higher concentrations, with the range separating these effects being somewhat narrow. At high concentrations, selenium can cause reproductive, congenital and developmental anomalies, with the central nervous system being affected by acute exposures (AMAP, 1998). Selenium is noted for its role in mediating the toxicity of several other metals such as mercury and cadmium. Besides a positive correlation with mercury in liver tissues in both pinniped and cetaceans, there is a positive correlation of selenium with age in several seal species (Furness and Rainbow, 1990).

Mean liver concentrations of selenium have been reported to be as high as 18.4 ppm in ringed seals (*Phoca hispida*) and 34.4 ppm in bearded seal (*Erignathus barbatus*), while walrus livers contained lower concentrations, with a mean of 3.14 ppm (AMAP, 1998). A threshold effect level for selenium in terrestrial mammals is 7 ppm dw, above which hepatic lesions are apparent (AMAP, 1998). In our study, selenium levels in sea otters averaged 6.33 ppm dw (1.77 ppm ww) in kidneys and 3.93 ppm dw (1.10 ppm ww) in livers.

Organochlorine Residues:

In general, the production and use of the organochlorine pesticides and PCBs have been banned or restricted in most developed countries; however, their persistence in the environment, bioaccumulation through the food chain, and continued use in some areas are cause for concern. Long-range transport from tropical regions (where they are still widely used) to arctic and temperate regions has been documented (Carey *et al*, 1998). In general, these chlorinated substances show toxicological effects in wildlife depending on their molecular structure and their degree of chlorination. Reduced reproductive rates of mink and American otters (*Lutra canadensis*) have been linked to organochlorine pesticides and PCBs in the Great Lakes regions (Wren, 1991). However, unlike sea otters these mustelids are predominately piscivorous, and their contaminant intake is directly linked to that food source. Sea otters (*Enhydra lutris nereis*) in California that died from infectious diseases and miscellaneous causes, such as neoplasia and emaciation, were found to have greater concentrations of PCBs and DDTs than those that died

from trauma and unknown causes (Nakata *et al.*, 1998).

Hexachlorocyclohexanes

Beta BHC - This compound (beta-benzenehexachloride) is an isomer of the insecticide classified as a hexachlorocyclohexane. Exposure to beta-BHC causes symptoms similar to DDT exposure in mammals (Klaasen, 1996). It also has been shown to have adverse effects on the immune system in rodents and other mammals (Carey *et al.*, 1998). Lindane (gamma-HCH), another isomer in this class, was shown to have a significant decrease in both whelping rate and litter size in mink related to embryo mortality (Beard, *et al.*, 1995). European otters in Orkney Islands, Scotland had a mean lindane concentration of 0.58 ppm (lipid weight) in liver tissue. In our study, beta-BHC was the only analyte within this class of compounds detected in enough sea otter tissue samples to be statistically compared among groups. The concentrations of beta-BHC found in our study ranged from nondetectable levels to 0.307 and 0.184 ppm dw (0.073 and 0.038 ppm ww) in livers and kidneys, respectively.

Cyclodiene Pesticides

Chlordane-related compounds - Chlordane was the first cyclodiene insecticide used in agriculture; however, all uses in the U.S. are now banned. Technical chlordane contains approximately 45 compounds, with nearly half of its components consisting of the following compounds: *cis*- and *trans*- nonachlor (7%); *cis*-chlordane (19%); and *trans*-chlordane, also known as *gamma*-chlordane,(24%). Heptachlor epoxide and oxychlordane are metabolites of these various components and are considered the most toxic metabolites (Eisler, 1990).

Mean liver oxychlordane reported in American otters was 13 ppb ww (Eisler,1990). The mean concentration of chlordane (reported as sum of chlordanes consisting of *cis*-chlordane, *trans*-chlordane, *cis*-nonachlor, and *trans*-nonachlor) found in livers from previously studied Alaskan sea otters was 15 ppb ww in 7 otters from the Aleutian Islands and 1 ppb ww in 7 otters from southeast Alaska, while levels in California sea otters averaged 31 ppb ww (Bacon, 1994). In our study, sea otter tissue concentrations for the following chlordane related analytes were as follows: *cis*-nonachlor (nondetectable levels to 0.05 ppm dw (0.01 ppm ww) in livers); heptachlor epoxide (nondectable levels to 0.09 ppm dw (0.02 ppm ww) and 0.05 ppm dw (0.01 ppm ww) in livers and kidneys, respectively); oxychlordane (nondetectable levels to 0.05 ppm dw (0.01 ppm ww) in both livers and kidneys); and *trans*-nonachlor (nondectable levels to 0.175 ppm dw (0.04 ppm ww) and 0.1 ppm dw (0.02 ppm ww) in livers and kidneys, respectively).

Dieldrin - Of the other cyclodiene pesticides analyzed, only dieldrin was detected in any of our sea otter samples. Dieldrin concentrations of 5 ppm in brains of mammals have been associated with lethality (Beyer, 1996). In addition to its neurological effects, dieldrin is a potent immunotoxicant, although doses in test organisms were orders of magnitude greater than relevant environmental levels (Carey *et al.*, 1998). In our study, sea otter livers and kidneys analyzed had ranges of dieldrin from nondetectable levels to 0.087 ppm dw (0.02 ppm ww) and 0.11 ppm dw (0.02 ppm ww), respectively. The mean level of dieldrin reported in livers from previously studied Alaskan sea otters was 3 ppb ww in 7 otters from the Aleutian Islands, and 2 ppb ww in 7 otters from southeast Alaska, while levels in California sea otters averaged 1 ppb ww. (Bacon, 1994).

Diphenyl Aliphatic Pesticides

DDT (dichlorodiphenyltrichloroethane) is probably the most notorious and best studied compound in this group. DDT's breakdown products, p,p'-DDD and p,p'-DDE, are more toxic than the parent compound and thus heavily studied. The mean level of p,p'-DDE reported in livers from previously studied Alaskan sea otters was 36 ppb ww in 7 otters from the Aleutian Islands and 2 ppb ww in 7 otters from Southeast Alaska, while levels in California sea otters averaged 1 ppb ww (Bacon, 1994). In our study, levels of p,p'-DDD in the sea otters ranged from nondetectable levels to 0.05 ppm dw (0.01 ppm ww) in both livers and kidneys, while levels of p,p'-DDE ranged from nondetectable levels to 0.44 ppm dw (0.11 ppm ww) and 0.21 ppm dw (0.04 ppm ww) in livers and kidneys, respectively.

Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are a group of global pollutants, formerly used widely in the electrical industry for their insulation properties, and now measurable in most organisms worldwide. The 209 congeners and their metabolites show wide differences in biological effects. A significant part of the toxicity associated with commercial PCB mixtures is related to the presence of about 20 planar congeners (congeners without chlorine substitution in the *ortho* position, or *non-ortho PCBs*), and these planar congeners have also been detected in many species, regardless of collection location. Tissue levels of PCBs, including planar congeners, are usually highest in animals from urban areas, accumulating in fat and liver tissue. PCB congeners 77, 126, and 169 were found to be the most toxic in rats (Eisler, 1996). The most familiar commercial PCB mixtures were the Aroclor groups, designated by numbers relating to the percent of chlorine in the mixture. Our analyses included Aroclors 1242, 1248, 1254 and 1260,

of which only Aroclors 1254 and 1260 were detected in any of our sea otter samples.

PCBs pose a potential threat to sea otters based on demonstrated links to reproductive effects in ranch mink with PCB exposure. Numerous toxicological studies have been conducted on ranch mink which demonstrate a dose-response relationship with the direct feeding of PCBs, or the feeding of food contaminated with PCBs. Such studies have been summarized and indicate that liver PCB levels above 4 ppm ww are associated with lethality in mink, and reproductive impairment occurs when fat concentrations exceed 10 ppm (Kamrin and Ringer, 1996). Several studies correlated tissue concentrations of Aroclor 1254 (1.23 ppm ww and 2.0 ppm ww) in mink livers with impaired reproductive success and reduced growth and survival of kits (Platonow and Karstad, 1973; Wren,*et al.*, 1987). A review of previous work establishing direct dose information for PCBs in mink and other mammals, including a description of physiological effects, is provided by Eisler (1996). Several studies have attempted to establish associations between elevated PCB levels and reduced reproductive status in wild mink and related species based on epidemiological assessments (Wren, 1991; Poole *et al.*, 1995); however, direct causes could not be established due to the presence of confounding factors including other contaminants.

Recent information concerning the differences in the metabolism and bioaccumulation of PCBs for closely related mustelid species may account for differences in PCB toxicity. These physiological differences, coupled with the fact that otters are exposed to higher concentrations of PCBs in their diet (than other mustelids), would increase their risk for these compounds (Leonards, *et al.*, 1998). Primary PCB congeners measured in the livers of mink in the Canadian Northwest Territories included PCB 99, 105, 138, 153, 180, and 170-190 (Poole, *et al.*, 1995). European otters have been shown to retain concentrations of PCB congeners 126 and 169 in their liver tissue (Leonards *et al.*, 1997). In previously studied sea otters from the Aleutian Islands, southeast Alaska and California, the major PCB congeners measured in the livers include 105, 118, 138, 153, and 180; however, congeners 126 and 156 together had the greatest contribution to toxicity (Bacon, *et al.*, 1999).

In our study, a subset of samples were analyzed for PCB Aroclors and were reported as Total PCBs, the sum of these Aroclors. Total PCBs reported in these samples ranged from nondetectable to 24.35 ppm dw (5.6 ppm ww) in sea otter livers and to 19.4 ppm dw (3.5 ppm ww) in sea otter kidneys. Concentrations of Aroclor 1254 ranged from nondetectable levels to 0.51 ppm dw (0.13 ppm ww) and 0.32 ppm dw (0.11 ppm ww) in livers and kidneys, respectively. Concentrations of Aroclor 1260 ranged from nondetectable levels to 0.42 ppm dw and 0.32 ppm dw in livers and kidneys, respectively. It is difficult to compare our PCB results

with other published values, because specific congener analyses and total PCB components are not always reported in the literature. Specific congener analyses varied within our study as well. Mean concentrations of some specific congeners in sea otter livers in our study are as follows: PCB 105 (0.34 ppb ww); PCB 118 (0.37 ppb ww); PCB 126 (0.01 ppb ww); PCB 156 (0.97 ppb ww); and PCB 170 (0.086 ppb ww). The mean concentration of PCB 126 in the sea otter livers in our study were comparable with Bacon's reported levels for sea otter livers from the Aleutian Islands (0.019 ppb ww); however, these values were an order of magnitude higher than concentrations in sea otter livers of the same study from Southeast Alaska (0.002 ppb ww). The mean concentration of PCB 169 in the sea otter livers in our study was an order of magnitude higher than Bacon's reported levels for sea otter livers from the Aleutian Islands (0.002 ppb ww).

CONCLUSION

In general, the majority of the sea otters in our study had relatively low levels of contaminant residues in their tissues, often near or below the analytical detection levels. Our results for most of the elemental analyses were relatively low, when compared with published values. Most noteworthy are our results for cadmium and chromium. In our study, average levels of cadmium detected in sea otters did not exceed the reported levels for toxic effects; however, concentrations were higher than those detected in European otters and lower than those detected in harbor seals (*Phoca vitulina*) from Kodiak Island, Alaska. The cadmium levels detected in two sea otters from the Aleutian Islands were an order of magnitude higher than all others in our study. Because this is an area of high geological activity, these levels may be consistent with normal background levels of cadmium in volcanic soils. Although the majority of our samples were below the detection level for chromium (therefore mean concentrations were not calculated), it is interesting to note that maximum levels of chromium in four sea otter kidneys exceeded the detection limit by two orders of magnitude.

The majority of our samples had no detectable concentrations of organochlorine compounds. However, lindane and total PCBs were detected in more than 10% of livers and kidneys analyzed; p,p'-DDE was detected in more than 10% of kidneys analyzed; and dieldrin and transnonachlor were detected in more than 10% of livers analyzed. For lindane, only four samples exceeded the detection limit by an order of magnitude. For dieldrin, our maximum values were all within the same order of magnitude as the detection limit, except for one kidney. In our study, the maximum dieldrin concentrations observed (0.02 ppm ww) in both kidneys and livers were an order of magnitude higher than results previously reported for sea otters from the Aleutian Islands and southeast Alaska (Bacon, 1994). For p,p'-DDE, our results were within the

same order of magnitude as previously reported for Aleutian sea otters and exceeded levels reported for southeast Alaska by one order of magnitude (Bacon, 1994). For trans-nonachlor, only three liver samples and one kidney sample exceeded the detection limit by one order of magnitude.

In general, the sea otters in our study had relatively low levels of PCBs, including PCB congeners. However, for several samples in which PCBs were measured as Total PCBs (sum of Aroclors), the levels were relatively high. Specifically, these were samples taken from areas of known localized contamination on Adak Island (analyzed in Catalog 7020043). The mean concentration of Total PCBs in several of these samples exceeded the values reported by Bacon by an order of magnitude, and were comparable to liver PCB concentrations of 4.2 ppm ww in mink that died after being fed PCB-contaminated fish (Aurelich, 1973). However, levels of PCB Aroclor 1254 reported in our study were less than levels found to cause reproductive effects in mink (Platanow and Karstad, 1973). A review of our results for PCB congeners of interest showed that PCB-126 (a relatively toxic congener) and PCB-169 were higher than some of the levels previously reported for Alaskan sea otters (Bacon, 1994). In general, levels of PCBs and PCB congeners in our study were comparable to values reported in other studies.

With respect to the recent sea otter population decline in the Aleutian Islands, reproductive effects of PCBs have been eliminated as a primary cause. This is based partly on the fact that there is no evidence that reproduction in sea otters at Adak is being suppressed; however, some anomalies in the overall seasonal patterns of reproduction were noted (Estes and Tinker, 1996). In addition, the localized presence of high PCB contamination at certain sites is inconsistent with the widespread nature of the sea otter population decline. Analyses of blue mussels, *Mytilus trossulus*, from sites throughout the Aleutian Islands indicate increased organochlorine pesticide and PCB contamination at several localized sites. These levels were compared to other Aleutian locations where there are lower levels of these same pollutants, presumably atmospherically deposited (Reese, 1998).

Overall, we found significant geographic differences in Alaska sea otter contaminant concentrations. Tissues from animals in the southcentral group contained significantly higher concentrations than those from southwest and/or southeast Alaska. Concentrations in samples from southwest and southeast tended to be similar, although southwest often had higher concentrations than southeast. The general pattern of contamination among groups is southcentral > southwest > southeast. This could possibly be attributed to distributional differences of some pollutants from anthropogenic sources and transport. Southcentral Alaska is more populated and is likely to have a higher input of contaminants on a local level, perhaps

reflected in sea otters. Although sea otters mainly feed on benthic invertebrates, they are opportunistic and may select fishes if the invertebrate supply is depleted. In the past, sea otters in some areas of the Aleutian Islands have been described as feeding on fish presumably due to decreased supply of invertebrates (Estes, et al 1982; Kenyon, 1969). In addition to regional differences in prey selection based on availability, sea otters have shown individual variations in their specific diet and foraging behavior which seem to be learned by the pup during the dependent period (Riedman, et. al, 1995). Therefore, variations in contaminant levels in individual animals may be explained by the consumption of certain prey items which may have differing contaminant loads.

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LITERATURE CITED

- AMAP, 1998. AMAP Assessment Report: Arctic Pollution Issues. Arctic Monitoring and Assessment Programme (AMAP). Oslo, Norway. xii +859 pp.
- Aulerich, R. J., and S. Iwamoto. 1973. Reproductive failure and mortality in mink fed Great Lakes fish. *J. Reprod. Fertil.* 19 (Suppl.):365-76.
- Bacon, C.E. 1994. An ecotoxicological comparison of organic contaminants in sea otters (*Enhydra lutris*) among populations in California and Alaska. MS Thesis. University of California, Santa Cruz, CA. 56pp.
- Bacon, C.E., W.M. Jarman, J.A. Estes, M.S. Simon, and R.J. Norstrom. 1999. Comparison of organochlorine contaminants among sea otter (*Enhydra lutris*) populations in California and Alaska. *Environmental Toxicology and Chemistry* 18 (3), pp.452-458.
- Beard, A.P., N.C. Rawlings. 1998. Reproductive effects in mink (*Mustela vison*) exposed to the pesticides Lindane, Carbofuran and Pentachlorophenol in a multigeneration study. *J Repro & Fertl.* 113(1): 95-104.
- Beyer, W.N., G.H. Heinz, A. Redmon-Norwood, eds. 1996. Environmental contaminants in wildlife: interpreting tissue concentrations. SETAC Special Publication Series, CRC, Lewis, NY. 494pp.
- Carey, J., P. Cook, J. Giesy, P. Hodson, D. Muir, J. Owens, K. Solomon, eds. 1998. Ecotoxicological risk assessment of the chlorinated organic chemicals. SETAC Pellston Workshop on Environmental Risk Assessment for Organochlorine Compounds; 1994 Jul 24-29;Aliston, Ontario, Canada. Pensacola, Florida, USA. 397p.
- Connel, D.W. 1990. Bioaccumulation of xenobiotic compounds. CRC Press, Inc., Boca Raton, Florida.
- Doroff A.M. and D. Mulcahy. 1997. A field guide to general necropsy and tissue collection for sea otters in Alaska. U.S. Fish and Wildl. Ser., Technical Report MMM 97-3. Anchorage, Alaska. 25pp.

- Eisler, R. 1985a. Cadmium hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Review Reports No. 2. U.S. Fish and Wildlife Service Biological Report 85 (1.2). Washington, DC. 60pp.
- Eisler, R. 1985b. Selenium hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Review Reports No. 5. U.S. Fish and Wildlife Service Biological Report 85(1.5). Washington, DC. 57pp.
- Eisler, R. 1986. Chromium hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Review Reports No. 6. U.S. Fish and Wildlife Service Biological Report 85(1.6). Washington, DC. 90pp.
- Eisler, R. 1987. Mercury hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Review Reports No. 10. U.S. Fish and Wildlife Service Biological Report 85 (1.10). Washington, DC. 90pp.
- Eisler, R. 1988. Arsenic hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Review Reports No. 12. U.S. Fish and Wildlife Service Biological Report 85(1.12). Washington, DC. 92pp.
- Eisler, R. 1990. Chlordane hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Review Reports No. 21. U.S. Fish and Wildlife Service Biological Report 85(1.21). Washington, DC. 49pp.
- Eisler, R. 1996. Planar PCB hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Review Report No. 31. National Biological Service Biological Report 31. Washington, DC. 75pp.
- Estes, J.A., C.E. Bacon, W.M. Jarman, R.J. Norstrom, R.G. Anthony, and A.K. Miles. 1996. Organochlorines in sea otters and bald eagles from the Aleutian Archipelago. Mar. Pollut. Bull. 34, 486-490.
- Estes, J.A. and M.T. Tinker. 1996. The population ecology of sea otters at Adak Island, Alaska. Final Report prepared for Naval Facilities Engineering Command, Paulsbo, WA. December 1996.
- Estes, J.A., R.J. Jameson, and E.B. Rhode. 1982. Activity and prey selection in the sea otter:

influence of population status on community structure. Am. Nat. 120:242-258.

Furness, R.W. and P.S. Rainbow. 1990. Heavy metals in the marine environment. CRC Press, Inc., Boca Raton, Florida, USA. 256p.

Giger, M. and K. Trust. 1997. Tissue concentrations of elemental and organochlorine compounds in sea otters from two Aleutian Islands in Alaska. U.S. Fish and Wildlife Service, Technical Report WAES-TR-97-01.

Goldblatt, C.J. and R.G. Anthony. 1983. Heavy metals in northern fur seals (*Callorhinus ursinus*) from the Pribolof Islands, Alaska. J. Environ. Qual. 12(4):478-82.

Kamrin, M.A. and R.K. Ringer. 1996. Toxicological implications of PCB residues in mammals. pp.153-63 in Beyer, N.W., G.H. Heinz, and A.W. Redmon-Norwood. 1996. Environmental contaminants in wildlife: interpreting tissue concentrations. SETAC Special Publication Series, CRC, Lewis, NY. 494pp.

Kenyon, K.W. 1969. The sea otter in the eastern Pacific Ocean. North Am. Fauna 68. 352pp.

Klaasen, C.D. 1996. Casarett and Doull's toxicology: the basic science of poisons.5th ed. McGraw-Hill, NY. 1111pp.

Law, R. 1996. Metals in marine mammals. pp. 357-376 in Beyer, N.W., G.H. Heinz, and A.W. Redmon-Norwood. 1996. Environmental contaminants in wildlife: interpreting tissue concentrations. SETAC Special Publication Series, CRC, Lewis, NY. 494pp.

Leonards, P.E.G., S. Broekhuizen, P. de Voogt, N.M. Van Straalen, U.A.Th. Brinkman, W.P. Cofino, and B. van Hattum. 1998. Studies of bioaccumulation and biotransformation of PCBs in mustelids based on concentration and congener patterns in predators and preys. Arch. Environ. Contam. Toxicol. 35,654-665.

Ma, W. 1996. Metals in mammals. pp. 281-296 in Beyer, N.W., G.H. Heinz, and A.W. Redmon-Norwood. 1996. Environmental contaminants in wildlife: interpreting tissue concentrations. SETAC Special Publication Series, CRC, Lewis, NY. 494pp.

Mason, C.F., and P. Reynolds. 1988. Organochlorine residues and metals in otters from the Orkney Islands. Mar. Pollut. Bull. 19, No.2, pp. 80-81.

- Nakata, H., K. Kannan, L. Jing, N. Thomas, S. Tanabe, and J.P. Giesy. 1998. Accumulation pattern of organochlorine pesticides and polychlorinated biphenyls in southern sea otters (*Enhydra lutris nereis*) found stranded along coastal California, USA. Environmental Pollution 103, 45-53.
- O'Shea, T.J. 1999. Environmental contaminants and marine mammals. pp. 485-564 in J.E. Reynolds III and S.A. Rommel, eds. Biology of Marine Mammals. Smith Ins. Press. Washington, D.C. 578pp.
- Platonow, N.S. and L.H. Karstad. 1973. Dietary effects of polychlorinated biphenyls on mink. Can. J. Comp. Med. 37:391-400.
- Poole, K.G., B.T. Elkin, and R.W. Bethke. 1995. Environmental contaminants in wild mink in the Northwest Territories, Canada. The Science of the Total Environ. 160/161, 473-486.
- Quakenbush, L.T. and Snyder-Conn. 1993. Pathology and contaminants case report on three Steller's eiders from Alaska. U.S. Fish and Wildlife Service Unpubl. tech. rep., NAES-TR-93-01. Fairbanks, AK. 32pp.
- Reese, S.L. 1998. Levels of organochlorine contamination in blue mussels, *Mytilus trossulus*, from the Aleutian Archipelago. Unpublished MS Thesis, University of California, Santa Cruz.
- Riedman, M.L. and J.A. Estes. 1990. The sea otter (*Enhydra lutris*): behavior, ecology, and natural history. U.S. Fish and Wildl. Serv. Biolo. Rep. 90. 126pp.
- Riedman, M..L., M.M. Staedler, J.A. Estes, and B. Hrabrich. 1995. Dietary specialization and kleptoparasitism in California sea otters. Proceedings from Eleventh Biennial Conference on the Biology of Marine Mammals, 14-18 December, 1995, Orlando, Florida. p. 97.
- Shaw, Stanton B. 1971. Chlorinated hydrocarbon pesticides in California sea otters and harbor seals. Calif. Fish and Game 57(4): 290-294.
- Smith, D.R., S. Nlemeyer, J.A. Estes, and A.R. Flegal. 1990. Stable lead isotopes evidence anthropogenic contamination in Alaskan sea otters. Environ. Sci. Technol. 24, 1517-1521.

Warbuton, J. and D.J. Seagars. 1993. Heavy metal concentrations in liver and kidney tissues of Pacific walrus. Marine Mammals Management, USFWS, Region 7, Anchorage, Alaska. 23pp.

Wren, C.D., D.B. Hunter, J.F. Leatherland and P.M. Stokes, 1987. The effects of polychlorinated biphenyls and methyl-mercury, singly and in combination, on mink. II: reproduction and kit development. Environ. Contam. Toxicol., 16:449-454.

Wren, C.D., 1991. Cause-effect linkages between chemicals and populations of mink (*Mustela vison*) and otter (*Lutra lutra*) in the Great Lakes Basin. J. Toxicol. Environ. Health, 33: 549-585.

Table 1. Sampling information from sea otter carcasses collected for contaminants assessment in Alaska and Russia, 1993-99. Ages in years was determined by cementum analyses of premolar teeth or estimated* if no tooth was available (A=adult, O=old adult, S=subadult). Sample sources were subsistence hunted animals (S) or beachcast carcasses (B). Sample matrix designated as kidney (K) or liver (L).

SOUTHWEST ALASKA

Animal ID	Location Obtained	Date Obtained	Sex	Age	Sample Source	Sample Matrix
195003	AK Peninsula, St. Catherine Cove, Unimak Island	08/12/1997	F	5	S	K / L
480002	Kodiak, Kupreanof Strait	03/15/1997	F	A*	S	K / L
480014	Kodiak, Kupreanof Strait	03/15/1997	F	4	S	K / L
480015	Kodiak, Kupreanof Strait	03/15/1997	F	3	S	K / L
570004	Kodiak, Kizhuyak Bay	02/23/1997	F	O*	S	K / L
570007	Kodiak, Kizhuyak bay	02/23/1997	F	O*	S	K / L
600001	AK Peninsula, Zachary Bay, Unga Island	02/08/1997	F	A*	S	K / L
600015	AK Peninsula, Zachary Bay, Shumagin Island	02/09/1997	M	14	S	K / L
BS97057	Kodiak, Spiridon Bay	11/13/1997	M	5	S	K / L
BS98006	Kodiak, Zachar Bay	01/05/1998	M	3	S	K / L
BS98014	AK Peninsula, King Cove	02/02/1998	M	4	S	K / L
BS94019	Aleutians, Kuluk Beach, Adak	07/24/1993	F	<1	B	K / L
BS94018	Aleutians, Adak	10/29/1993	F	<1	B	K / L
BS94022	Aleutians, Clam Lagoon, Adak	01/31/1994	M	7	B	K / L
BS94021	Aleutians, Fuel Pier, Adak	03/17/1994	F	13	B	K / L
BS94020	Aleutians, Shemya	03/17/1994	M	<1	B	K / L

Table 1. Continued.

SOUTHCENTRAL ALASKA

Animal ID	Location	Date Collected	Sex	Age	Sample Source	Sample Matrix
140007	PWS, Nelson Bay	02/12/1998	M	10	S	K/L
BS94004	PWS, Shoup Bay	04/05/1994	M	1	S	L
BS94006	PWS, Shoup Bay	04/04/1994	M	1	S	L
BS94007	PWS, Shoup Bay	04/04/1994	M	1	S	L
BS94009	PWS, Shoup Bay	04/06/1994	M	7	S	L
BS94010	PWS, Shoup Bay	04/06/1994	M	2	S	L
BS94011	PWS, Sawmill Bay	04/06/1994	M	3	S	L
BS94012	PWS, Sawmill Bay	04/06/1994	M	4	S	L
BS94016	PWS, Naked Island	10/21/1994	F	5	S	K / L
BS94017	PWS, Naked Island	10/21/1994	M	1	S	K / L
BS96009	Resurrection Bay, Seward	08/07/1993	M	3	B	K / L
BS96011	PWS, Naked Island	10/21/1994	M	<1	S	K / L
BS96012	PWS, Naked Island	10/21/1994	M	2	S	K / L
BS96013	PWS, Naked Island	10/21/1994	M	9	S	K / L
BS96023A	PWS, Naked Island	10/24/1994	M	5	S	K / L
BS97012	PWS, Port of Valdez	01/31/1997	M	A*	S	K / L
BS97018	PWS, Port of Valdez	01/31/1997	M	A*	S	K / L
BS97030	PWS, Sawmill Bay	04/08/1997	F	12	B	K / L
BS97044	Kachemak Bay, Seldovia	12/27/1997	F	2	S	K / L
BS97048	Kachemak Bay, Seldovia	01/08/1998	F	A*	S	K / L
BS98001	Kachemak Bay, Homer Boat Harb.	05/16/1997	M	S*	B	K / L
BS98016	Kachemak Bay, Seldovia Bay	12/27/1997	F	2	S	K / L
BS98026	PWS, Mud Bay	02/13/1998	F	2	S	K / L
BS98029	Kachemak Bay, Homer Spit	06/03/1997	M	<1	B	K / L
BS98030	Kachemak Bay, Seldovia	01/06/1998	M	9	S	K / L
BS98031	PWS, Spike Island	03/12/1998	F	8	S	K / L
BS98032	Resurrection Bay, Seward	04/08/1998	M	2	O	K / L
BS98036	Resurrection Bay, Seward	05/25/1998	M	9	O	K / L
PW96219	PWS, Mud Bay	02/02/1998	M	9	S	K / L

Table 1. Continued.

SOUTHEAST ALASKA

Animal ID	Location Harvested/obtained	Date Harvested/obtained	Sex	Age	Sample Source	Sample Matrix
230001	SE, Spaski Island	02/17/1998	M	1	S	K / L
500001	SE, Rowan Bay	03/13/1997	M	4	S	K / L
500003	SE, Rowan Bay	03/08/1997	M	<1	S	K / L
500004	SE, Rowan Bay	03/13/1997	M	5	S	K / L
500006	SE, Rowan Bay	03/13/1997	M	5	S	K / L
500007	SE, Rowan Bay	03/08/1997	M	5	S	K / L
500008	SE, Rowan Bay	03/13/1997	M	8	S	K / L
500009	SE, Rowan Bay	03/08/1997	M	A*	S	K / L
500010	SE, Rowan Bay	03/15/1997	M	5	S	K / L
650002	SE, Sitka Sound	10/12/1997	M	3	S	K / L
BS94001	SE, Salisbury Sound	02/10/1994	F	3	S	K / L
BS97011	SE, Sitka Sound	12/17/1997	F	3	S	K / L
BS97023	SE, Salisbury Sound	01/11/1997	F	6	S	K / L
BS97036	SE, Scraggy Island near Sitka	09/07/1997	F	7	S	K / L
BS98019	SE, Yakutat Bay	02/03/1998	M	8	S	K / L
BS98022	SE, Ogden Passage	03/02/1998	M	6	S	K / L
BS98028	SE, Yakutat Bay	02/18/1997	M	5	S	K / L
BS98033	SE, Yakutat Bay	01/14/1997	M	A*	S	K / L
BS98034	SE, Yakutat Bay	01/31/1997	M	<1	S	K / L
KL96003	SE, Hole in the Wall, Craig	04/11/1998	F	1	S	K / L
YA96030	SE, Lisianski Inlet	02/01/1998	F	3	S	K / L

RUSSIA

Animal ID	Location	Date Collected	Sex	Age	Sample Source	Sample Matrix
RU98001	Vestnik Bay, Kamchatka, Russia	07/12/97	F	A*	B	K/L
RU98002	Vestnik Bay, Kamchatka, Russia	07/15/97	M	S*	B	K/L

Table 2: Elemental contaminants in kidney and liver tissue of sea otters from Alaska and Russia, 1993-99. Concentrations are reported in mg/kg (ppm) dry weight. Geometric means were only calculated for those analytes where 50% or more of the measured values were above detection limit (values below detection limit were assigned values of half the detection limit). Minimum values are reported as either the lowest concentration detected or < detection limit. N = number of samples that passed QA/QC. Detects = % of samples that had analyte concentrations above detection limit.

Analyte	Southeast AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Kidney:															
Al	13	0.0%		17	0.0%		9	22.2%	(<4.99 - 7.96)	2	0.0%		41	4.9%	(<4.789 - 7.96)
As	21	95.2%	1.75 (<0.479 - 4.49)	22	95.5%	2.16 (<0.5 - 6.06)	16	93.8%	1.79 (<0.5 - 3.93)	2	100.0%	(0.824; 2.17)	61	95.1%	1.88 (<0.479 - 6.06)
B	21	4.8%	(<0.479 - 1.19)	22	4.5%	(<2 - 2.54)	16	25.0%	(<0.499 - 0.827)	2	0.0%		61	9.8%	(<0.479 - 2.54)
Ba	21	4.8%	(<0.479-2.02)	22	0.0%		16	0.0%		2	0.0%		61	1.6%	(<0.479 - 2.02)
Be	21	9.5%	(<0.096-0.82)	22	4.5%	(<0.1 - 0.25)	16	0.0%		2	0.0%		61	4.9%	(<0.096 - 0.82)
Cd	21	100.0%	19.62 (2.67- 69.18)	22	100.0%	20.58 (1.44 - 214)	16	93.8%	14.17 (<0.0998 - 179)	2	100.0%	(14.9; 87.9)	61	98.4%	18.70 (<0.096 - 214)
Cr	21	4.8%	(<0.5 - 2.32)	22	9.1%	(<0.5 - 1.08)	16	31.3%	(<0.5 - 62.4)	2	0.0%		61	16.4%	(<0.5 - 62.4)
Cu	21	100.0%	19.01 (11.4 - 42.8)	22	100.0%	18.47 (10.2 - 29.8)	16	100.0%	15.46 (7.7 - 25.2)	2	100.0%	(18.4 - 23.7)	61	100.0%	17.87 (7.7 - 42.8)
Fe	21	100.0%	380.03 (126.0 - 779.0)	22	100.0%	475.05 (143 - 1218)	16	100.0%	392.48 (127.0 - 857)	2	100.0%	(533 - 746)	61	100.0%	422.34 (126.0 - 1218)
Hg	21	90.5%	0.983 (<0.096 - 2.23)	22	95.5%	1.09 (<0.2 - 10.7)	16	93.8%	0.063 (<0.1 - 4.66)	2	100.0%	(0.43; 0.61)	61	93.4%	0.70 (<0.096 - 10.7)
Mg	21	100.0%	493.68 (367.0 - 670.0)	22	100.0%	469.22 (299 - 612)	16	100.0%	421.15 (177.0 - 610)	2	100.0%	(393.0 - 586)	61	100.0%	464.50 (177.0 - 670)
Mn	21	100.0%	3.99 (2.63 - 7.61)	22	100.0%	3.53 (2.28 - 5.27)	16	100.0%	3.57 (1.38 - 7.8)	2	100.0%	(2.62 - 3.43)	61	100.0%	3.68 (1.38 - 7.8)
Mo	21	4.8%	(<0.479 - 0.503)	22	0.0%		16	25.0%	(<0.499 - 0.895)	2	0.0%		61	8.2%	(<0.479 - 0.89)
Ni	21	33.3%	(<0.5 - 1.72)	22	22.7%	(<0.5 - 1.4)	16	25.0%	(<0.499 - 4.42)	2	50.0%	(<0.5 - 0.60)	61	36.1%	(<0.499 - 4.42)

Table 2. Continued

	Southeast AK			South central AK			Southwest AK			Russia			All Regions		
Analyte	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Kidney:															
Pb	21	4.8%	- (<0.5 - 0.98)	22	9.1%	- (<0.5 - 0.53)	16	0.0%	-	2	0.0%	-	61	4.9%	(<0.5 - 0.99)
Se	21	100.0%	5.21 (2.56 - 11.0)	22	100.0%	8.31 (1.56 - 22.9)	16	100.0%	5.52 (0.888 - 22.7)	2	100.0%	(7.19 - 7.36)	61	100.0%	6.33 (0.888 - 22.9)
Sr	21	4.8%	- (<0.192 - 0.58)	22	22.7%	- (<0.5 - 1.04)	16	31.3%	- (<0.2 - 1.34)	2	0.0%	-	61	19.7%	- (<0.192 - 1.34)
V	21	52.4%	0.69 (<0.479 - 4.4)	22	40.9%	- (<0.5 - 2.85)	16	37.5%	- (<0.499 - 3.87)	2	100.0%	(2.22 - 2.52)	61	45.9%	- (<0.479 - 4.4)
Zn	21	100.0%	88.70 (50.8 - 124)	22	100.0%	95.92 (50.5 - 215)	16	100.0%	79.34 (32.0 - 143)	2	100.0%	(96.4 - 98.5)	61	100.0%	88.88 (32.0 - 215)

Table 2. Continued

Analyte	Southeast AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Liver:															
Al	13	0.0%		24	0.0%		9	11.1%	(<5 - 5.72)	2	0.0%		48	2.1%	(<4.883 - 5.72)
As	21	81.0%	0.753 (<0.498 - 1.47)	29	93.1%	1.042 (<0.488 - 3.38)	16	81.3%	0.74 (<0.5 - 1.98)	2	100.0%	(0.616 - 0.835)	68	91.2%	0.88 (<0.488 - 3.38)
B	21	4.8%	(<0.498 - 0.702)	29	24.1%	(<0.488 - 3.16)	16	25.0%	(<0.502 - 1.18)	2	0.0%		68	17.6%	(<0.488 - 3.16)
Ba	21	0.0%		29	0.0%		16	0.0%		2	0.0%		68	0.0%	
Be	21	4.8%	(<0.099 - 0.13)	29	3.4%	(<0.098 - 0.11)	16	6.3%	(<0.1 - 0.1)	2	0.0%		68	4.4%	(<0.098 - 0.13)
Cd	21	100.0%	5.15 (1.68 - 24.78)	29	100.0%	6.09 (0.55 - 31.0)	16	93.8%	3.90 (<0.1 - 20.1)	2	100.0%	(4.98 - 26.6)	68	98.5%	5.31 (<0.098 - 31.0)
Cr	21	4.8%	(<0.5 - 0.82)	29	10.3%	(<0.5 - 1.025)	16	31.3%	(<0.5 - 5.86)	2	0.0%		68	17.6%	(<0.5 - 5.86)
Cu	21	100.0%	52.98 (28.0 - 87.8)	29	100.0%	84.02 (33.4 - 227.0)	16	100.0%	54.24 (4.29 - 175)	2	100.0%	(26.6 - 45.2)	68	100.0%	64.05 (4.29 - 227)
Fe	21	100.0%	783.43 (266.0 - 1978)	29	100.0%	1342.80 (400 - 4501)	16	100.0%	1174.77 (392 - 3640)	2	100.0%	(1198.0 - 1537)	68	100.0%	1102.09 (266 - 4501)
Hg	21	95.2%	0.771 (<0.099 - 1.74)	29	100.0%	3.04 (0.038 - 15.7)	16	100.0%	1.26 (0.234 - 12.8)	2	100.0%	(0.493 - 1.12)	68	98.5%	1.55 (<0.098 - 15.7)
Mg	21	100.0%	628.84 (540.0 - 803.9)	29	100.0%	636.16 (510 - 840.7)	16	100.0%	656.95 (600.0 - 797)	2	100.0%	(493.0 - 543)	68	100.0%	634.83 (493 - 840.7)
Mn	21	100.0%	12.07 (7.87 - 21.5)	29	100.0%	14.54 (8.12 - 34.4)	16	100.0%	9.73 (1.94 - 28.3)	2	100.0%	(6.87 - 8.72)	68	100.0%	12.26 (1.94 - 34.4)
Mo	21	4.8%	(<0.498 - 1.271)	29	24.1%	(<0.488 - 1.89)	16	25.0%	(<0.502 - 1.582)	2	0.0%		68	17.6%	(<0.488 - 1.897)

Table 2. Continued

	Southeast AK			South central AK			South west AK			Russia			All Regions		
Analyte	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Ni	21	14.3%	- (<0.5 - 1.21)	29	10.3%	- (<0.5 - 1.85)	16	25.0%	- (<0.5 - 1.4)	2	0.0%	-	68	14.7%	- (<0.5 - 1.85)
Liver:															
Pb	21	4.8%	- (<0.5 - 0.637)	29	34.3%	- (<0.5 - 1.665)	16	6.3%	- (<0.5 - 0.95)	2	0.0%	-	68	23.5%	- (<0.5 - 1.66)
Se	21	100.0%	2.33 (1.1- 6.21)	29	100.0%	6.07 (1.59 - 16.7)	16	100.0%	3.29 (1.18 - 16.6)	2	100.0%	- (6.23 - 7.99)	68	100.0%	3.93 (1.1 - 16.7)
Sr	21	9.5%	- (<0.199 - 0.816)	29	10.3%	- (<0.195 - 0.59)	16	18.8%	- (<0.201 - 1.57)	2	0.0%	-	68	19.1%	- (<0.195 - 1.57)
V	21	28.6%	- (<0.498 - 3.44)	29	27.6%	- (<0.488 - 2.43)	16	31.3%	- (<0.5 - 2.13)	2	0.0%	-	68	27.9%	- (<0.488 - 3.44)
Zn	20	100.0%	125.23 (109.0 - 172.3)	29	100.0%	150.26 (97.4 - 261.0)	16	100.0%	141.28 (90.3 - 220.0)	2	100%	- (77.5-98.5)	65	100.0%	137.78 (90.3 - 261)

Table 3: Organochlorine contaminants in kidney and liver tissue of sea otters from Alaska and Russia, 1993-99. Concentrations are reported in mg/kg (ppm) dry weight. Geometric means were only calculated for those analytes where 50% or more of the measured values were above detection limit (values below detection limit were assigned values of half the detection limit). Minimum values are reported as either the lowest concentration detected or < detection limit. N = number of samples that passed QA/QC. Detects = % of samples that had analyte concentrations above detection limit.

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Kidney:															
alpha BHC	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
alpha chlordan	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
beta BHC	20	60.0% (<0.029 - 0.112)	0.039	22	13.6% (<0.027 - 0.184)	-	16	75.0% (<0.018 - 0.167)	0.044	2	0.0%		60	50.0% (<0.018 - 0.184)	0.17
cis-nonachlor	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
delta BHC	12	0.0%		17	0.0%		9	0.0%		2	0.0%		40	0.0%	
dieldrin	20	0.0%		22	4.5% (<0.027 - 0.077)	-	16	12.5% (<0.018 - 0.111)	-	2	0.0%		60	5.0% (<0.018 - 0.111)	
endrin	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
gamma BHC	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
gamma chlordan	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
heptachlor epoxide	20	0.0%		22	0.0%		16	12.5% (<0.018 - 0.056)	-	2	0.0%		60	3.3% (<0.018 - 0.056)	
mirex	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
o,p'-DDD	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
o,p'-DDE	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	
o,p'-DDT	20	0.0%		22	0.0%		16	0.0%		2	0.0%		60	0.0%	

Table 3. Continued

Analyte	Southeast AK		Southcentral AK		Southwest AK		Russia		All Regions			
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Kidney:												
oxychlordane	20	0.0%		22	0.0%		16	12.5% (<0.018 - 0.056)	-	2	0.0%	
p,p'-DDD	20	0.0%		22	0.0%		16	6.3% (<0.018 - 0.05)	-	2	0.0%	
p,p'-DDE	12	0.0%		17	29.4% (<0.029 - 0.209)	-	4	25.0% (0.041 - 0.059)	-	2	0.0%	
p,p'-DDT	20	0.0%		22	0.0%		16	0.0%		2	0.0%	
PCB-1242	20	0.0%		22	0.0%		11	0.0%		2	0.0%	
PCB-1248	20	0.0%		22	0.0%		11	0.0%		2	0.0%	
PCB-1254	12	0.0%		17	11.8% (<0.029 - 0.324)	-	4	0.0%		2	0.0%	
PCB-1260	20	0.0%		22	4.5% (0.029 - 0.324)	-	11	0.0%		2	0.0%	
PCB-TOTAL	8	0.0%		5	0.0%		12	41.7% (<0.089 - 19.44)	-	25	20.0% (<0.089 - 19.44)	
toxaphene	20	0.0%		22	0.0%		16	0.0%		2	0.0%	
trans-nonachlor	20	0.0%		22	9.1% (<0.027 - 0.094)	-	16	18.8% (<0.018 - 0.1)	-	2	0.0%	
										60	8.3% (<0.018 - 0.1)	

Table 3. Continued

Analyte	Southeast AK		Southcentral AK		Southwest AK		Russia		All Regions			
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Liver:												
alpha BHC	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
alpha chlordane	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
beta BHC	21	9.5% (<0.029 - 0.052)		29	3.4% (<0.031 - 0.307)		16	31.3% (<0.031 - 0.217)		2	0.0%	68
cis-nonachlor	21	0.0%		29	0.0%		16	12.5% (<0.031 - 0.05)		2	0.0%	68
delta BHC	13	0.0%		24	0.0%		9	0.0%		2	0.0%	48
dieldrin	21	0.0%		29	6.9% (<0.031 - 0.076)		16	31.3% (<0.031 - 0.087)		2	0.0%	68
endrin	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
gamma BHC	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
gamma chlordane	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
heptachlor epoxide	21	0.0%		29	0.0%		16	18.8% (0.05 - 0.087)		2	0.0%	68
mirex	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
o,p'-DDD	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
o,p'-DDE	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
o,p'-DDT	21	0.0%		29	0.0%		16	0.0%		2	0.0%	68
oxychlordane	21	0.0%		29	0.0%		16	18.8% (<0.031 - 0.05)		2	0.0%	68
p,p'-DDD	21	0.0%		29	0.0%		16	12.5% (<0.031 - 0.05)		2	0.0%	68

Table 3. Continued

Analyte	Southeast AK			Southcentral AK			Southwest AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
p,p'-DDE	13	0.0%		24	12.5%	- (<0.032 - 0.438)	4	0.0%		2	0.0%		43	7.0%	- (<0.029 - 0.44)
Liver:															
p,p'-DDT	21	0.0%		29	0.0%		16	0.0%		2	0.0%		68	0.0%	
PCB-1242	20	0.0%		22	0.0%		11	0.0%		2	0.0%		55	0.0%	
PCB-1248	20	0.0%		22	0.0%		11	0.0%		2	0.0%		55	0.0%	
PCB-1254	12	0.0%		17	17.6%	- (<0.032 - 0.518)	4	0.0%		2	0.0%		35	8.6%	- (<0.0312 - 0.518)
PCB-1260	20	0.0%		22	13.6%	- (<0.032 - 0.438)	11	0.0%		2	0.0%		55	5.5%	- (<0.0312 - 0.438)
PCB-TOTAL	9	0.0%		12	0.0%		12	41.7%	- (<0.156 - 24.35)				33	15.2%	- (<0.156 - 24.35)
toxaphene	21	0.0%		29	0.0%		16	0.0%		2	0.0%		68	0.0%	
trans-nonachlor	21	0.0%		29	13.8%	- (<0.032 - 0.175)	16	18.8%	- (<0.031 - 0.13)	2	0.0%		68	10.3%	- (<0.029 - 0.175)

Table 4: PCB congener concentrations in kidney and liver tissue of sea otters from Alaska and Russia, 1993-99. Concentrations are reported in ug/kg (**ppb**) dry weight. Geometric means were only calculated for those analytes where 50% or more of the measured values were above detection limit (values below detection limit were assigned values of half the detection limit). Minimum values are reported as either the lowest concentration detected or < detection limit. N = number of samples used to calculate mean; Detects = % of samples that had analyte concentrations above detection limit.

Analyte	Southeast AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Kidney:															
PCB# 8	12	33.3%	(<0.029 - 0.194)	15	66.7%	(<0.029 - 0.314)	9	22.2%	(<0.041 - 0.492)	36	44.4%	(<0.029 - 0.492)			
PCB# 9	4	50.0%	(<0.029 - 0.046)	10	60.0%	(<0.029 - 0.129)	2	100.0%	(0.041 - 0.041)	16	62.5%	(0.042 - 0.129)			
PCB# 16	4	100.0%	(0.043 - 0.24)	10	100.0%	(0.046 - 1.65)	2	100.0%	(0.073 - 0.492)	16	100.0%	(0.291 - 1.65)			
PCB# 17	4	50.0%	(<0.029 - 0.097)	10	100.0%	(0.032 - 0.263)	2	100.0%	(0.041 - 0.451)	16	87.5%	(0.070 - 0.451)			
PCB# 18	16	0.0%		12	0.0%		9	0.0%		2	0.0%		39	0.0%	
PCB# 22	4	100.0%	(0.036 - 0.217)	10	90.0%	(<0.029 - 0.228)	2	100.0%	(0.049 - 0.697)	16	93.8%	(0.110 - 0.697)			
PCB# 25	4	50.0%	(<0.029 - 0.046)	10	70.0%	(<0.029 - 0.064)	2	100.0%	(0.041 - 0.205)	16	68.8%	(0.051 - 0.205)			
PCB# 29	4	50.0%	(<0.029 - 0.046)	10	60.0%	(<0.029 - 0.061)	2	100.0%	(0.041 - 0.041)	16	62.5%	(0.043 - 0.061)			

Table 4. Continued (Kidney tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 30	4	50.0%	0.051 (<0.029 - 0.046)	10	60.0%	0.046 (<0.029 - 0.058)	2	100.0%	- (0.041 - 0.041)	16	62.5%	0.028 (<0.029 - 0.058)			
PCB# 31	20	60.0%	0.815 (<0.029 - 2.57)	22	77.3%	0.591 (<0.029 - 3.38)	11	36.4%	- (0.041 - 3.32)	2	100.0%	0.487 (0.487 - 1.03)	55	63.6%	0.713 (<0.029 - 3.38)
PCB# 32	16	0.0%		12	0.0%		9	0.0%		2	0.0%		39	0.0%	
PCB# 33	16	0.0%		12	0.0%		9	11.1%	- (0.084 - 4.71)	2	0.0%		39	2.6%	- (<0.059 - 4.71)
PCB# 39	4	50.0%	0.024 (<0.029 - 0.046)	10	60.0%	0.030 (<0.029 - 0.058)	2	100.0%	- (0.041 - 0.053)	16	62.5%	0.028 (<0.029 - 0.058)			
PCB# 41	4	50.0%	0.024 (<0.029 - 0.046)	10	50.0%	0.030 (<0.029 - 0.052)	2	100.0%	- (0.041 - 0.041)	16	56.3%	0.024 (<0.029 - 0.052)			
PCB# 44	16	25.0%	- (<0.067 - 1.2)	12	33.3%	- (<0.059 - 3.53)	9	22.2%	- (0.084 - 1.07)	2	100.0%	- (0.623 - 1.8)	39	30.8%	- (<0.059 - 3.53)
PCB# 47	8	87.5%	0.265 (<0.067 - 0.522)	7	85.7%	0.423 (<0.059 - 2.51)	2	100.0%	- (0.641 - 0.84)	2	100.0%	- (0.256 - 0.487)	19	89.5%	0.464 (<0.059 - 2.51)
PCB# 48	8	62.5%	0.531 (<0.067 - 1.18)	7	100.0%	0.472 (0.237 - 11.5)	2	50.0%	- (0.084 - 0.63)	2	50.0%	- (<0.073 - 1.2)	19	73.7%	0.693 (<0.059 - 11.5)
PCB# 48/4	4	100.0%	0.202 (0.146 - 0.41)	10	100.0%	0.350 (0.127 - 0.899)	2	100.0%	- (0.405 - 0.82)	16	100.0%	- (0.127 - 0.899)			

Table 4. Continued (Kidney tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 49	16	50.0%	2.76 (<0.067 - 4.25)	12	58.3%	1.95 (<0.059 - 5.31)	9	22.2%	- (<0.084 - 4.03)	2	100.0%	- (2.09 - 3.22)	39	48.7%	- (<0.059 - 5.31)
PCB# 52	12	33.3%	- (<0.029 - 1.21)	15	66.7%	1.11 (<0.029 - 2.9)	9	22.2%	- (<0.041 - 1.86)				36	44.4%	- (<0.029 - 2.9)
PCB# 53	4	50.0%	0.020 (<0.029 - 0.046)	10	70.0%	0.050 (<0.029 - 0.069)	2	100.0%	- (0.041 - 0.148)				16	68.8%	0.028 (<0.029 - 0.148)
PCB# 55	4	50.0%	0.020 (<0.029 - 0.046)	10	50.0%	0.030 (<0.029 - 0.052)	2	100.0%	- (0.041 - 0.041)				16	56.3%	0.025 (<0.029 - 0.052)
PCB# 60	12	33.3%	- (<0.029 - 0.533)	17	76.5%	4.330 (<0.029 - 1.59)	4	75.0%	1.261 (<0.041 - 0.041)	2	100.0%	- (0.352 - 0.403)	35	62.9%	1.46 (<0.029 - 1.59)
PCB# 61/6	4	75.0%	0.060 (<0.029 - 0.117)	10	60.0%	0.051 (<0.029 - 0.148)	2	100.0%	- (0.041 - 0.041)				16	68.8%	0.031 (<0.029 - 0.148)
PCB# 66	4	100.0%	0.810 (0.157 - 1.58)	10	100.0%	2.01 (0.029 - 2.65)	2	100.0%	- (0.891 - 1.11)				16	100.0%	1.710 (0.029 - 2.65)
PCB# 70	20	50.0%	0.745 (<0.029 - 7.67)	22	72.7%	0.744 (<0.029 - 1.7)	11	36.4%	- (<0.041 - 2.9)	2	100.0%	- (2.05 - 4.12)	55	58.2%	0.804 (<0.029 - 15.6)
PCB# 71	16	12.5%	- (<0.067 - 0.706)	12	16.7%	- (<0.059 - 3.28)	9	11.1%	- (<0.084 - 0.282)	2	0.0%		39	12.8%	- (<0.059 - 3.28)
PCB# 72	4	50.0%	0.021 (<0.029 - 0.046)	10	50.0%	0.031 (<0.029 - 0.725)	2	100.0%	- (0.041 - 0.041)				16	56.3%	0.040 (<0.029 - 0.725)

Table 4. Continued (Kidney tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 74	4	100.0%	0.654 (0.121-1.21)	10	100.0%	1.39 (0.255 - 1.99)	2	100.0%	- (0.729 - 0.82)				16	100.0%	0.053 (0.121 - 1.99)
PCB # 74/88	8	50.0%	0.070 (<0.067 - 1.43)	7	71.4%	0.092 (<0.059 - 3.53)	2	100.0%	- (0.641 - 1.64)	2	100.0%	- (1.05 - 1.21)	19	68.4%	0.09 (<0.059 - 3.53)
PCB# 77	20	60.0%	0.431 (<0.029 - 1.1)	22	77.3%	0.293 (<0.029 - 12.5)	11	36.4%	- (<0.041 - 0.882)	2	100.0%	- (0.586 - 0.936)	55	63.6%	0.389 (<0.029 - 12.5)
PCB# 80	4	100.0%	0.032 (0.029 - 0.046)	10	100.0%	0.043 (0.029 - 0.04)	2	100.0%	- (0.041 - 0.041)				16	100.0%	0.04 (0.029 - 0.052)
PCB# 81	12	100.0%	0.760 (0.029 - 3.98)	17	100.0%	0.292 (0.029 - 5.91)	4	100.0%	.442 (0.041 - 4.15)	2	100.0%	- (3.66 - 4.49)	35	100.0%	0.494 (0.029 - 5.91)
PCB# 84	4	100.0%	4.26 (0.464 - 5.86)	10	100.0%	0.051 (0.787 - 7.33)	2	100.0%	- (1.76 - 3.48)				16	100.0%	0.05 (0.464 - 7.33)
PCB# 85	8	87.5%	0.743 (<0.067 - 1.33)	7	100.0%	0.427 (0.386 - 3.82)	2	100.0%	- (0.855 - 1.72)	2	100.0%	- (1.21- 1.95)	19	94.7%	1.27 (<0.059 - 3.82)
PCB# 87	4	100.0%	1.00 (0.157 - 1.83)	10	100.0%	2.35 (0.324 - 3.4)	2	100.0%	- (0.972 - 1.15)				16	100.0%	1.45 (0.157 - 3.4)
PCB# 88	8	0.0%		5	0.0%		7	0.0%					20	0.0%	
PCB# 91	4	100.0%	0.20 (0.036 - 0.33)	10	100.0%	0.45 (0.06 - 0.515)	2	100.0%	- (0.219 - 0.32)				16	100.0%	0.351 (0.036 - 0.515)

Table 4. Continued (Kidney tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 95	16	50.0%	4.04 (<0.067 - 5.41)	12	58.3%	0.611 (<0.059 - 10)	9	22.2%	- (<0.084 - 3.11)	2	100.0%	- (2.38 - 4.49)	39	48.7%	- (<0.059 - 10)
PCB# 99	8	100.0%	1.42 (0.261 - 2.37)	7	100.0%	0.60 (0.467 - 6.18)	2	100.0%	- (1.03 - 2.23)	2	100.0%	- (1.65 - 2.58)	19	100.0%	0.871 (0.261 - 6.18)
PCB# 101	16	43.8%	- (<0.067 - 7.0)	12	50.0%	1.31 (<0.059 - 19.7)	9	33.3%	- (<0.084 - 6.72)	2	100.0%	- (3.66 - 6.37)	39	46.2%	- (<0.059 - 19.7)
PCB# 105	4	100.0%	1.01 (0.046 - 2.16)	10	100.0%	0.426 (0.107 - 3.25)	2	100.0%	- (0.053 - 0.729)				16	100.0%	0.27 (0.046 - 3.25)
PCB # 105/141	16	37.5%	- (<0.067 - 7.33)	12	50.0%	1.23 (<0.059 - 16.5)	9	44.4%	- (<0.084 - 5.88)	2	100.0%	- (4.03 - 7.49)	39	46.2%	- (<0.059 - 16.5)
PCB# 110	4	100.0%	0.77 (0.314 - 2.03)	10	100.0%	1.62 (0.403 - 3.48)	2	100.0%	- (1.17 - 2.34)				16	100.0%	1.38 (0.3 - 3.48)
PCB# 114	4	100.0%	0.09 (0.036 - 0.183)	10	100.0%	0.11 (0.046 - 0.29)	2	100.0%	- (0.069 - 0.119)				16	100.0%	0.057 (0.036 - 0.29)
PCB# 118	20	60.0%	1.141 (<0.029 - 9.0)	22	77.3%	2.844 (<0.029 - 25.6)	11	54.5%	1.671 (<0.041 - 7.98)	2	100.0%	- (6.23 - 12.7)	55	67.3%	1.912 (<0.029 - 25.6)
PCB# 123	4	100.0%	0.473 (0.043 - 1.1)	10	100.0%	0.351 (0.139 - 0.89)	2	100.0%	- (0.078 - 0.32)				16	100.0%	0.234 (0.043 - 1.1)
PCB# 126	12	41.7%	- (<0.029 - 0.08)	17	70.6%	0.051 (<0.029 - 0.2)	4	50.0%	0.050 (<0.041 - 0.074)	2	50.0%	- (<0.073 - 0.33)	35	57.1%	0.050 (<0.029 - 0.33)

Table 4. Continued (Kidney tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 128	20	55.0%	0.612 (<0.029 - 3.15)	22	77.3%	1.290 (<0.029 - 6.76)	11	36.4%	- (<0.041 - 2.02)	2	100.0%	- (1.94 - 2.85)	55	61.8%	0.891 (<0.029 - 6.67)
PCB# 132	16	43.8%	- (<0.067 - 1.23)	12	58.3%	0.440 (<0.059 - 3.24)	9	11.1%	- (<0.084 - 0.42)	2	100.0%	0.64 (0.121 - 1.16)	39	43.6%	- (<0.059 - 3.24)
PCB# 137	8	75.0%	1.11 (<0.067 - 1.63)	7	100.0%	0.33 (0.137 - 1.91)	2	100.0%	- (0.897 - 1.34)	2	100.0%	- (1.72 - 1.84)	19	89.5%	1.01 (<0.059 - 1.91)
PCB# 138	20	55.0%	1.390 (<0.029 - 23.4)	22	77.3%	5.166 (<0.029 - 38.2)	11	45.5%	- (<0.041 - 9.31)	2	100.0%	- (6.96 - 11.6)	55	63.6%	2.66 (<0.029 - 38.2)
PCB# 146	8	87.5%	1.692 (<0.033 - 3.67)	7	100.0%	0.891 (0.42 - 7.65)	2	100.0%	- (1.37 - 4.62)	2	100.0%	- (1.43 - 3.45)	19	94.7%	1.90 (<0.029 - 7.65)
PCB# 149	8	75.0%	1.97 (<0.033 - 5.0)	7	100.0%	2.03 (0.611 - 29.4)	2	100.0%	- (0.598 - 3.45)	2	100.0%	- (1.61 - 4.49)	19	89.5%	3.06 (<0.029 - 29.4)
PCB# 151	16	37.5%	- (<0.033 - 4.67)	12	41.7%	- (<0.029 - 10.9)	9	33.3%	- (<0.042 - 1.72)	2	100.0%	- (0.476 - 0.824)	39	41.0%	- (<0.029 - 10.9)
PCB# 153	20	65.0%	2.246 (<0.029 - 36.6)	22	77.3%	6.545 (<0.029 - 64.7)	11	54.5%	5.74 (<0.041 - 18.1)	2	100.0%	- (9.89 - 19.5)	55	69.1%	3.81 (<0.029 - 64.7)
PCB# 154	8	100.0%	0.27 (0.084 - 0.351)	7	100.0%	0.20 (0.168 - 0.824)	2	100.0%	- (0.269 - 0.278)	2	100.0%	- (0.158 - 0.236)	19	100.0%	0.24 (0.084 - 0.824)
PCB# 156	20	55.0%	0.439 (<0.029 - 1.5)	22	77.3%	0.621 (<0.029 - 2.94)	11	36.4%	- (<0.041 - 0672)	2	100.0%	- (0.55 - 0.974)	55	61.8%	0.532 (<0.029 - 2.94)

Table 4. Continued (Kidney tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 157	12	100.0%	0.272 (0.036 - 0.569)	17	100.0%	0.352 (0.046 - 0.73)	4	100.0%	0.263 (0.097 - 0.324)	2	100.0%	- (0.158 - 0.449)	35	100.0%	0573 (0.036 - 0.73)
PCB# 158	12	100.0%	0.484 (0.125 - 2.28)	17	100.0%	0.975 (0.13 - 12.4)	4	100.0%	0.777 (0.462 - 1.68)	2	100.0%	- (0.824 - 0.952)	35	100.0%	0.743 (0.125 - 12.4)
PCB# 163	8	75.0%	1.461 <td>7</td> <td>100.0%</td> <td>0.772 (0.195 - 9.71)</td> <td>2</td> <td>100.0%</td> <td>0.924 (0.924 - 1.32)</td> <td>2</td> <td>100.0%</td> <td>- (1.54 - 1.87)</td> <td>19</td> <td>89.5%</td> <td>0.853 (<0.029 - 9.71)</td>	7	100.0%	0.772 (0.195 - 9.71)	2	100.0%	0.924 (0.924 - 1.32)	2	100.0%	- (1.54 - 1.87)	19	89.5%	0.853 (<0.029 - 9.71)
PCB# 166	4	100.0%	0.031 (0.029 - 0.046)	10	100.0%	0.063 (0.034 - 0.094)	2	100.0%	0.041 (0.041 - 0.041)				16	100.0%	0.061 (0.029 - 0.94)
PCB# 167	12	33.3%	- (<0.029 - 0.769)	15	66.7%	0.0595 (<0.029 - 1.97)	9	22.2%	- (<0.041 - 0.402)				36	44.4%	- (<0.029 - 1.97)
PCB# 169	20	20.0%	- (<0.029 - 0.046)	22	50.0%	0.094 (<0.029 - 4.31)	11	18.2%	- (<0.041 - 0.09)	2	0.0%		55	30.9%	- (<0.029 - 4.31)
PCB# 170	20	60.0%	0.421 (<0.029 - 1.35)	22	77.3%	0.681 (<0.09 - 3.82)	11	45.5%	- (<0.041 - 1.9)	2	100.0%	- (0.696 - 0.861)	55	65.5%	0.562 (<0.029 - 3.82)
PCB# 174	16	43.8%	- (<0.033 - 0.533)	12	58.3%	0.282 (<0.029 - 3.53)	9	33.3%	- (<0.042 - 1.79)	2	100.0%	- (0.293 - 0.326)	39	48.7%	- (<0.029 - 3.53)
PCB# 180	16	50.0%	1.493 (<0.033 - 3.86)	12	58.3%	0.247 (<0.029 - 19.1)	9	44.4%	- (<0.042 - 5.52)	2	100.0%	- (1.65 - 2.1)	39	53.8%	1.22 (<0.029 - 19.1)
PCB# 182	8	0.0%		7	28.6%	- (<0.029 - 0.323)	2	0.0%		2	0.0%		19	10.5%	- (<0.029 - 0.323)

Table 4. Continued (Kidney tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 183	8	87.5%	0.783 (<0.033 - 1.12)	7	100.0%	0.418 (0.206 - 5.88)	2	100.0%	- (0.299 - 1.01)	2	100.0%	- (0.374 - 0.659)	19	94.7%	0.605 (<0.029 - 5.88)
PCB# 187	8	75.0%	1.331 (<0.033 - 2.5)	7	100.0%	0.963 (0.378 - 16.8)	2	100.0%	- (0.556 - 1.89)	2	100.0%	- (1.5 - 1.83)	19	89.5%	1.297 (<0.029 - 16.8)
PCB# 189	16	37.5%	- (<0.033 - 0.332)	12	50.0%	0.304 (<0.029 - 0.452)	9	22.2%	- (<0.042 - 0.193)	2	100.0%	- (0.077 - 0.127)	39	41.0%	- (<0.029 - 0.452)
PCB# 190	8	75.0%	0.276 (<0.033 - 0.54)	7	100.0%	0.166 (0.091 - 1.44)	2	100.0%	- (0.302 - 0.333)	2	100.0%	- (0.11 - 0.202)	19	89.5%	0.234 (<0.029 - 1.44)
PCB# 194	16	56.3%	1.707 (<0.033 - 4.47)	12	58.3%	1.149 (<0.029 - 4.83)	9	22.2%	- (<0.042 - 2.35)	2	100.0%	- (0.513 - 1.39)	39	51.3%	1.097 (<0.029 - 4.83)
PCB# 195	8	37.5%	- (<0.033 - 0.463)	7	71.4%	0.066 (<0.029 - 1.34)	2	100.0%	- (0.18 - 0.361)	2	100.0%	- (0.081 - 0.157)	19	63.2%	0.252 (<0.029 - 1.34)
PCB# 206	8	75.0%	0.201 (<0.033 - 5.02)	7	85.7%	0.237 (<0.029 - 27.1)	2	100.0%	- (0.513 - 5.04)	2	100.0%	- (0.449 - 0.476)	19	84.2%	0.084 (<0.029 - 27.1)
PCB# 209	8	25.0%	- (<0.033 - 1.08)	7	57.1%	0.022 (<0.029 - 1.99)	2	100.0%	- (0.598 - 0.924)	2	50.0%	- (<0.037 - 0.403)	19	47.4%	- (<0.029 - 1.99)

Table 4. Continued (Liver tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
Liver:															
PCB# 8	12	33.3%	0.305 (<0.031 - 0.112)	15	66.7%	0.208 (<0.032 - 0.153)	9	22.2%	- (<0.033 - 0.131)	36	44.4%	- (<0.031 - 0.153)			
PCB# 9	4	100.0%	0.039 (0.031 - 0.046)	10	100.0%	0.035 (0.032 - 0.047)	2	100.0%	- (0.036 - 0.036)	16	100.0%	0.035 (0.031 - 0.047)			
PCB# 17	4	100.0%	0.04 (0.031 - 0.042)	10	100.0%	0.05 (0.032 - 0.102)	2	100.0%	- (0.036 - 0.039)	16	100.0%	0.04 (0.031 - 0.102)			
PCB# 18	16	0.0%		12	0.0%		9	0.0%		2	0.0%		39	0.0%	
PCB# 22	4	100.0%	0.041 (0.035 - 0.049)	10	100.0%	0.070 (0.046 - 0.123)	2	100.0%	- (0.05 - 0.089)	16	100.0%	0.055 (0.035 - 0.123)			
PCB# 25	4	100.0%	0.037 (0.031 - 0.038)	10	100.0%	0.035 (0.032 - 0.047)	2	100.0%	- (0.033 - 0.036)	16	100.0%	0.037 (0.031 - 0.047)			
PCB# 29	4	100.0%	0.037 (0.031 - 0.038)	10	100.0%	0.035 (0.032 - 0.047)	2	100.0%	- (0.033 - 0.036)	16	100.0%	0.033 (0.031 - 0.047)			
PCB# 30	4	100.0%	0.037 (0.031 - 0.038)	10	100.0%	0.035 (0.033 - 0.047)	2	100.0%	- (0.033 - 0.036)	16	100.0%	0.037 (0.031 - 0.047)			
PCB# 31	20	60.0%	0.787 (<0.031 - 3.04)	22	77.3%	0.579 (<0.032 - 5.46)	11	36.4%	- (<0.033 - 4.38)	2	100.0%	(1.15 - 13.5)	55	63.6%	0.748 (<0.031 - 13.5)
PCB# 32	16	0.0%		12	0.0%		9	0.0%		2	0.0%		39	0.0%	
PCB# 33	16	0.0%		12	0.0%		9	0.0%		2	0.0%		39	0.0%	
PCB# 39	4	100.0%	0.037 (0.031 - 0.038)	10	100.0%	0.035 (0.032 - 0.047)	2	100.0%	- (0.033 - 0.036)	16	100.0%	0.033 (0.031 - 0.047)			

Table 4. Continued (Liver tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 41	4	100.0%	0.037 (0.031 - 0.038)	10	100.0%	0.035 (0.032 - 0.047)	2	100.0%	- (0.033 - 0.036)				16	100.0%	0.037 (0.031 - 0.047)
PCB# 44	16	43.8%	0.21 (<0.058 - 1.26)	12	58.3%	1.98 (<0.064 - 4.38)	9	22.2%	- (<0.067 - 1.38)	2	50.0%	- (<0.069 - 0.451)	39	43.6%	0.21 (<0.058 - 4.38)
PCB# 47	8	100.0%	0.428 (0.342 - 0.692)	7	100.0%	1.273 (0.26 - 4.78)	2	100.0%	- (0.572 - 0.767)	2	100.0%	- (0.212 - 0.625)	19	100.0%	0.325 (0.212 - 4.78)
PCB# 48	8	0.0%		7	0.0%		2	0.0%		2	0.0%		19	0.0%	
PCB# 48/4	4	100.0%	0.167 (0.136 - 0.174)	10	100.0%	0.184 (0.171 - 0.278)	2	100.0%	- (0.268 - 0.393)				16	100.0%	0.261 (0.136 - 0.393)
PCB# 49	16	31.3%	- (<0.058 - 3.89)	12	33.3%	- (<0.064 - 8.37)	9	11.1%	- (<0.067 - 3.17)	2	100.0%	- (2.62 - 3.4)	39	30.8%	- (<0.058 - 8.37)
PCB# 52	12	33.3%	- (<0.031 - 0.417)	15	66.7%	- (<0.032 - 1.89)	9	22.2%	- (<0.03 - 0.929)				36	44.4%	- (<0.031 - 1.89)
PCB# 53	4	100.0%	0.0354 (0.031 - 0.038)	10	100.0%	0.034 (0.033 - 0.048)	2	100.0%	- (0.033 - 0.036)				16	100.0%	0.034 (0.031 - 0.048)
PCB# 55	4	100.0%	0.034 (0.031 - 0.038)	10	100.0%	0.034 (0.032 - 0.047)	2	100.0%	- (0.033 - 0.036)				16	100.0%	0.034 (0.031 - 0.047)
PCB# 60	12	50.0%	0.156 (<0.031 - 0.735)	17	76.5%	0.225 (<0.032 - 2.87)	4	100.0%	0.156 (0.043 - 0.505)	2	50.0%	- (<0.06 - 0.295)	35	68.6%	0.129 (<0.031 - 2.87)
PCB# 61/6	4	100.0%	0.034 (0.031 - 0.038)	10	100.0%	0.034 (0.032 - 0.34)	2	100.0%	- (0.033 - 0.036)				16	100.0%	0.033 (0.031 - 0.34)
PCB# 66	4	100.0%	0.181 (0.109 - 0.249)	10	100.0%	0.43 (0.126 - 3.67)	2	100.0%	- (0.184 - 0.296)				16	100.0%	0.156 (0.109 - 3.67)

Table 4. Continued (Liver tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 70	20	55.0%	0.647 (<0.031 - 2.29)	22	77.3%	0.654 (<0.032 - 4.62)	11	36.4%	1.28 (<0.033 - 5.05)	2	50.0%	- (<0.069 - 1.01)	55	60.0%	0.663 (<0.031 - 5.05)
PCB# 71	16	12.5%	- (<0.058 - 0.253)	12	33.3%	- (<0.064 - 0.546)	9	22.2%	- (<0.067 - 1.04)	2	50.0%	- (<0.069 - 0.111)	39	23.1%	- (<0.058 - 1.04)
PCB# 72	4	100.0%	0.033 (0.031 - 0.038)	10	100.0%	0.034 (0.032 - 0.047)	2	100.0%	- (0.033 - 0.036)				16	100.0%	0.033 (0.031 - 0.047)
PCB# 74	4	100.0%	0.122 (0.066 - 0.154)	10	100.0%	0.312 (0.091 - 2.88)	2	100.0%	- (0.154 - 0.225)				16	100.0%	0.122 (0.066 - 2.88)
PCB# 77	20	60.0%	0.333 (<0.031 - 0.598)	22	77.3%	0.178 (<0.032 - 1.18)	11	36.4%	0.62 (<0.033 - 0.404)	2	100.0%	- (0.466 - 0.521)	55	63.6%	0.274 (<0.031 - 1.18)
PCB# 80	4	100.0%	0.033 (0.031 - 0.038)	10	100.0%	0.361 (0.032 - 0.362)	2	100.0%	- (0.033 - 0.036)				16	100.0%	0.033 (0.031 - 0.362)
PCB# 81	12	100.0%	0.566 (0.031 - 4.59)	17	100.0%	0.212 (0.032 - 3.87)	4	100.0%	0.295 (0.033 - 2.96)	2	100.0%	- (2.11 - 3.3)	35	100.0%	0.356 (0.031 - 4.59)
PCB# 84	4	100.0%	0.651 (0.298 - 0.951)	10	100.0%	1.08 (0.476 - 27.9)	2	100.0%	- (0.59 - 1.18)				16	100.0%	0.515 (0.298 - 27.9)
PCB# 85	8	75.0%	0.226 (<0.058 - 0.365)	7	100.0%	1.641 (0.251 - 10.4)	2	100.0%	- (0.081 - 0.667)	2	100.0%	- (0.394 - 0.903)	19	89.5%	0.379 (<0.058 - 10.4)
PCB# 87	4	100.0%	0.274 (0.178 - 0.393)	10	100.0%	0.497 (0.214 - 10.7)	2	100.0%	- (0.361 - 0.429)				16	100.0%	0.263 (0.178 - 10.7)
PCB# 88	8	0.0%		5	0.0%		7	0.0%					20	0.0%	
PCB# 91	4	100.0%	0.052 (0.031 - 0.066)	10	100.0%	0.079 (0.041 - 1.72)	2	100.0%	- (0.079 - 0.079)				16	100.0%	0.057 (0.031 - 1.72)

Table 4. Continued (Liver tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 95	16	56.3%	2.67 (<0.058 - 3.89)	12	58.3%	4.101 (<0.064 - 18.7)	9	22.2%	- (<0.067 - 2.3)	2	100.0%	- (2.8 - 3.44)	39	51.3%	2.62 (<0.058 - 18.7)
PCB# 99	8	100.0%	0.258 (0.096 - 0.532)	7	100.0%	2.15 (0.093 - 14.7)	2	100.0%	- (0.505 - 1.0)	2	100.0%	- (0.574 - 1.08)	19	100.0%	0.553 (0.093 - 14.7)
PCB# 101	16	50.0%	0.789 (<0.058 - 1.06)	12	58.3%	8.70 (<0.064 - 75.7)	9	22.2%	- (<0.067 - 3.67)	2	100.0%	- (1.58 - 3.82)	39	48.7%	1.29 (<0.058 - 75.7)
PCB# 105	4	100.0%	0.217 (0.144 - 0.302)	10	100.0%	0.369 (0.136 - 12.1)	2	100.0%	- (0.193 - 0.25)				16	100.0%	0.237 (0.136 - 12.1)
PCB# 105/141	16	31.3%	0.114 (<0.058 - 3.02)	12	58.3%	4.189 (<0.064 - 19.5)	9	22.2%	- (<0.067 - 1.53)	2	100.0%	- (1.72 - 4.17)	39	41.0%	- (<0.058 - 19.5)
PCB# 110	4	100.0%	0.336 (0.295 - 0.382)	10	100.0%	0.507 (0.272 - 2.34)	2	100.0%	- (0.536 - 0.59)				16	100.0%	0.475 (0.272 - 2.34)
PCB# 114	4	100.0%	0.033 (0.031 - 0.038)	10	100.0%	0.047 (0.032 - 0.837)	2	100.0%	- (0.033 - 0.036)				16	100.0%	0.037 (0.031 - 0.837)
PCB# 118	20	70.0%	1.038 (<0.031 - 4.59)	22	77.3%	2.165 (<0.032 - 71.7)	11	36.4%	- (<0.033 - 0.929)	2	100.0%	- (1.68 - 5.21)	55	67.3%	0.94 (<0.031 - 71.7)
PCB# 123	4	100.0%	0.07 (0.031 - 0.134)	10	100.0%	0.104 (0.034 - 3.53)	2	100.0%	- (0.033 - 0.089)				16	100.0%	0.053 (0.031 - 3.53)
PCB# 126	12	58.3%	0.041 (<0.031 - 0.077)	17	64.7%	0.042 (<0.032 - 0.248)	4	75.0%	0.048 (<0.033 - 0.145)	2	50.0%	- (<0.069 - 0.083)	35	62.9%	0.043 (<0.031 - 0.248)
PCB# 128	20	55.0%	0.371 (<0.031 - 0.598)	22	77.3%	0.936 (<0.032 - 18.1)	11	36.4%	- (<0.033 - 0.667)	2	100.0%	- (0.43 - 1.32)	55	61.8%	0.433 (<0.031 - 18.1)
PCB# 132	16	50.0%	0.803 (<0.058 - 1.14)	12	58.3%	1.75 (<0.064 - 0.98)	9	22.2%	- (<0.067 - 0.433)	2	100.0%	- (0.147 - 0.312)	39	48.7%	- (<0.058 - 3.23)

Table 4. Continued (Liver tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 137	8	75.0%	1.07 (<0.058 - 1.5)	7	100.0%	1.87 (0.122 - 5.18)	2	100.0%	- (0.733 - 1.04)	2	100.0%	- (0.276 - 1.01)	19	89.5%	0.643 (<0.058 - 5.18)
PCB# 138	20	65.0%	1.048 (<0.031 - 3.22)	22	77.3%	3.835 (<0.032 - 107)	11	36.4%	- (<0.033 - 3.67)	2	100.0%	- (1.97 - 4.86)	55	65.5%	1.853 (<0.031 - 107)
PCB# 146	8	100.0%	0.599 (0.057 - 0.812)	7	100.0%	6.14 (0.847 - 39.8)	2	100.0%	- (0.909 - 2.87)	2	100.0%	- (0.538 - 1.32)	19	100.0%	0.50 (0.057 - 39.8)
PCB# 149	8	100.0%	0.826 (0.308 - 5.65)	7	100.0%	11.17 (0.9 - 47.8)	2	100.0%	- (0.404 - 2.4)	2	100.0%	- (2.54 - 2.95)	19	100.0%	2.072 (0.308 - 47.8)
PCB# 151	16	50.0%	0.444 (<0.029 - 1.03)	12	58.3%	4.45 (<0.032 - 26.7)	9	22.2%	- (<0.033 - 0.767)	2	100.0%	- (0.394 - 0.59)	39	48.7%	0.637 (<0.029 - 26.7)
PCB# 153	20	70.0%	1.304 (<0.029 - 4.81)	22	77.3%	4.448 (<0.032 - 175)	11	45.5%	- (<0.033 - 2.96)	2	100.0%	- (3.58 - 6.6)	55	69.1%	2.076 (<0.029 - 175)
PCB# 154	8	75.0%	0.037 (<0.029 - 0.318)	7	85.7%	0.362 (<0.032 - 2.03)	2	50.0%	- (<0.033 - 0.091)	2	100.0%	- (0.09 - 0.09)	19	78.9%	0.036 (<0.029 - 2.03)
PCB# 156	20	55.0%	0.264 (<0.029 - 0.317)	22	77.3%	0.508 (<0.032 - 7.97)	11	27.3%	- (<0.033 - 0.259)	2	100.0%	- (0.204 - 0.382)	55	60.0%	0.366 (<0.029 - 7.97)
PCB# 157	12	91.7%	0.147 (<0.029 - 0.21)	17	100.0%	0.037 (0.032 - 1.81)	4	100.0%	0.09 (0.036 - 0.131)	2	100.0%	- (0.165 - 0.25)	35	97.1%	0.130 (<0.029 - 1.81)
PCB# 158	12	91.7%	0.117 (<0.029 - 0.498)	17	100.0%	0.521 (0.034 - 9.3)	4	100.0%	0.213 (0.061 - 0.525)	2	100.0%	- (0.129 - 0.326)	35	97.1%	0.267 (<0.029 - 9.3)
PCB# 163	8	75.0%	0.66 (<0.029 - 1.79)	7	85.7%	5.15 (<0.032 - 27.9)	2	50.0%	- (<0.033 - 1.47)	2	100.0%	- (0.538 - 1.39)	19	78.9%	0.981 (<0.029 - 27.9)
PCB# 166	4	100.0%	0.037 (0.031 - 0.038)	10	100.0%	0.034 (0.032 - 0.307)	2	100.0%	- (0.033 - 0.036)				16	100.0%	0.037 (0.031 - 0.307)

Table 4. Continued (Liver tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 167	12	33.3%	(<0.031 - 0.069)	15	66.7%	(<0.032 - 3.07)	9	22.2%	(<0.033 - 0.079)				36	44.4%	(<0.031 - 3.07)
PCB# 169	20	20.0%	(<0.029 - 0.038)	22	45.5%	(<0.032 - 0.326)	11	18.2%	(<0.033 - 0.039)	2	0.0%		55	29.1%	(<0.029 - 0.326)
PCB# 170	20	55.0%	0.216 (<0.029 - 0.259)	22	77.3%	0.433 (<0.032 - 8.37)	11	36.4%	0.6 (<0.033 - 0.273)	2	100.0%	(0.15 - 0.382)	55	61.8%	0.321 (<0.029 - 8.37)
PCB# 174	16	31.3%	(<0.029 - 0.311)	12	58.3%	1.50 (<0.032 - 2.51)	9	11.1%	(<0.033 - 0.263)	2	100.0%	(0.057 - 0.139)	39	38.5%	(<0.029 - 2.51)
PCB# 180	16	50.0%	1.50 (<0.029 - 3.17)	12	58.3%	5.9 (<0.032 - 39.8)	9	22.2%	(<0.033 - 1.03)	2	100.0%	(0.466 - 0.938)	39	48.7%	(<0.029 - 39.8)
PCB# 182	8	0.0%		7	57.1%	2.38 (<0.032 - 3.78)	2	50.0%	(<0.033 - 0.044)	2	0.0%		19	26.3%	(<0.029 - 3.78)
PCB# 183	8	87.5%	0.104 (<0.029-0.389)	7	100.0%	4.75 (0.119 - 15.5)	2	100.0%	(0.091 - 0.323)	2	100.0%	(0.14 - 0.16)	19	94.7%	0.166 (<0.029 - 15.5)
PCB# 187	8	100.0%	0.631 (0.21 - 3.48)	7	100.0%	11.11 (0.9 - 33.1)	2	100.0%	(2.29 - 5.67)	2	100.0%	(1.04 - 1.67)	19	100.0%	0.932 (0.21- 33.1)
PCB# 189	16	25.0%	(<0.029 - 0.221)	12	41.7%	(<0.032 - 0.598)	9	11.1%	(<0.033 - 0.135)	2	0.0%		39	25.6%	(<0.029 - 0.598)
PCB# 190	8	62.5%	0.026 (<0.029 - 0.117)	7	71.4%	0.193 (<0.032 - 2.19)	2	50.0%	(<0.033 - 0.073)	2	100.0%	(0.039 - 0.09)	19	68.4%	0.039 (<0.029 - 2.19)
PCB# 194	16	37.5%	(<0.029 - 0.692)	12	41.7%	(<0.032 - 4.38)	9	22.2%	(<0.033 - 0.842)	2	100.0%	(0.344 - 0.417)	39	38.5%	(<0.029 - 4.38)
PCB# 195	8	25.0%	(<0.029 - 0.067)	7	71.4%	0.293 (<0.032 - 4.78)	2	50.0%	(<0.033 - 0.074)	2	0.0%		19	42.1%	(<0.029 - 4.78)

Table 4. Continued (Liver tissue; ppb)

Analyte	South east AK			South central AK			South west AK			Russia			All Regions		
	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)	N	Detects	Mean (Range)
PCB# 206	8	50.0%	0.066 (<0.029 - 0.44)	7	42.9%	- (<0.032 - 39.8)	2	50.0%	- (<0.033 - 0.28)	2	0.0%	-	19	42.1%	- (<0.029 - 39.8)
PCB# 209	8	12.5%	- (<0.029 - 0.07)	7	42.9%	- (<0.032 - 2.94)	2	50.0%	- (<0.033 - 0.197)	2	0.0%	-	19	26.3%	- (<0.029 - 2.94)

Table 5. Results of tests for differences in tissue metal concentrations among geographic groups of sea otters from Alaska, 1993-99. Within each tissue type, all analytes were tested multivariately (MANOVA), followed by univariate analyses (ANOVA with Bonferroni-corrected post hoc comparisons) to determine specific group differences, except AS in liver, which was only tested univariately (Kruskal-Wallis rank sum). Significant differences are indicated by different letters. A dash indicates insignificance in the overall multivariate model, and therefore no univariate testing was performed.

Metal	Liver Tissue			Kidney Tissue		
	Southcentral (n=29)	Southeast (n=21)	Southwest (n=16)	Southcentral (n=22)	Southeast (n=21)	Southwest (n=16)
As	A	B	A, B	-	-	-
Cu	A	B	B	A	A	A
Fe	A	B	A, B	-	-	-
Hg	A	B	B	A	B	A, B
Mn	A	A	A	-	-	-
Se	A	B	B	A	A	A
Zn	A	B	A, B	-	-	-

Table 6. Summary of Total PCBs in kidneys and livers of five sea otters from the Aleutian Islands. Concentrations are reported in mg/kg (ppm) wet weight. (Data originally presented in Giger and Trust, 1997).

Sample ID	Matrix	Percent Lipid	Percent Moisture	Total PCBs (mg/kg)
BS94018	Kidney	1.41	82	3.5
BS94019	Kidney	4.38	80	0.78
BS94020	Kidney	1.38	83	0.11
BS94021	Kidney	1.31	78	1.5
BS94022	Kidney	1.36	81	0.17
				Mean = 1.21
				Range = (0.11 - 3.5)
				Geometric mean = 0.598
BS94018	Liver	1.64	77	5.60
BS94019	Liver	4.37	75	0.59
BS94020	Liver	2.44	80	0.49
BS94021	Liver	1.63	78	1.80
BS94022	Liver	2.01	78	0.43
				Mean = 1.78
				Range = (0.43 - 5.6)
				Geometric mean = 1.046

Table 7. Results of tests for differences in tissue PCB concentrations among geographic groups of sea otters from Alaska, 1993-99. Significant differences are indicated by different letters, and a dash indicates insignificance in the overall multivariate model, and therefore no univariate testing was performed.

PCB Congener	Liver Tissue			Kidney Tissue		
	Southcentral (n=17)	Southeast (n=12)	Southwest (n=4)	Southcentral (n=17)	Southeast (n=12)	Southwest (n=4)
118 ¹	A	B	A, B	A	A	A
126 ²	A	A	A	A	A	A
128 ¹	A	B	A, B	A	A	A
138 ¹	A	B	A, B	A	A	A
153 ¹	A	B	A, B	A	A	A
156 ¹	A	B	A, B	A	A	A
158 ¹	A	B	A, B	A	A	A
169 ²	A	A	A	A	A	A
170 ¹	A	B	A, B	-	-	A
31 ¹	A	A	A	-	-	A
70 ¹	A	A	A	A	A	A
77 ¹	A	A	A	A	A	A
81 ¹	A	A	A	A	A	A

¹Tested for differences among groups using multivariate analysis of variance on factor scores from the first two principal components (liver) or on analytes (kidney), with univariate Bonferroni-adjusted post-hoc testing.

²Tested for differences among groups using Kuskal-Wallis rank sum tests.

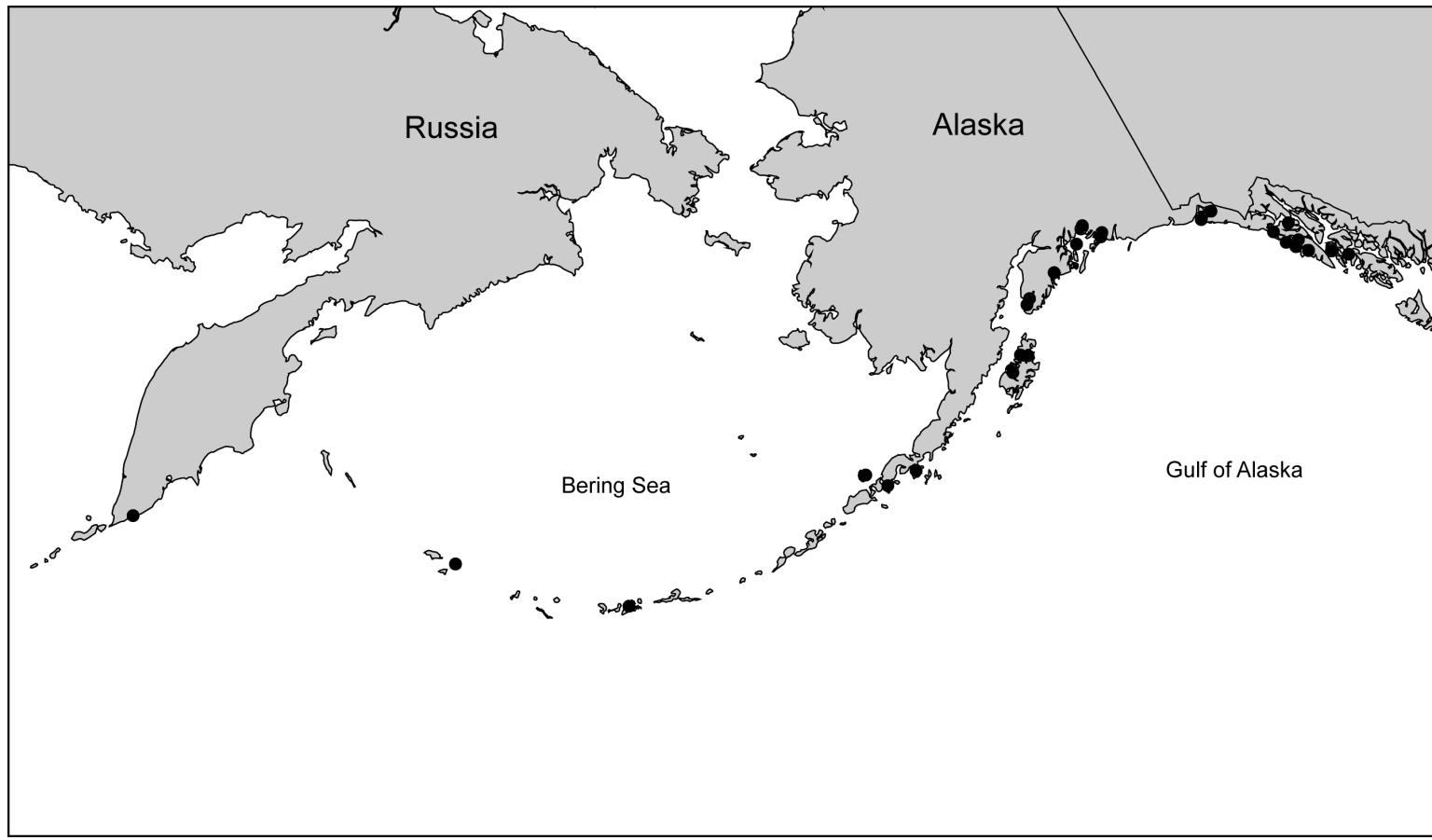


Figure 1. Locations of sea otter carcasses collected for contaminant assessment in Alaska and Russia.

Appendix A. List of sea otter samples by Catalog (USFWS Environmental Contaminants Program). Includes summary of QA/QC information for each Catalog. All tissues (L=liver, K=kidney) analyzed for both organochlorine and elemental residues, unless otherwise noted.

CATALOG #	ANIMAL ID	MATRIX	SAMPLE #	QA/QC NOTES
7010024	BS94001	K	B94001K*	All results for this catalog met all QA/QC parameters.
	BS94001	L	B94001L	
	BS94004	L	B94004L	
	BS94006	L	B94006L	
	BS94007	L	B94007L	
	BS94009	L	B94009L	
	BS94010	L	B94010L	
	BS94011	L	B94011L	
	BS94012	L	B94012L	
7020030	BS94019	K / L	M116K, L	The following analytes did not meet QA/QC parameters: HCB: 61.54% spike recovery ppDDE: 61.54% spike recovery 30.77% RPD (duplicates)
	BS94018	K / L	M118K, L	
	BS94022	K / L	M121K, L	
	BS94021	K / L	M137K, L	
	BS94020	K / L	M138K, L	
7020043	480002	K / L	480002K, L	The following analytes did not meet QA/QC parameters: HCB: 63.5% spike recovery ppDDE: 71.8% spike recovery delta BHC: 76% spike recovery PCB 126: 73.3% spike recovery PCB 158: 72.3% spike recovery PCB 81: 80.6% spike recovery PCB 1254: 70.6% spike recovery Al: 73% recovery (Standard Ref Material)
	480014	K / L	480014K, L	
	480015	K / L	480015K, L	
	500001	K / L	500001K, L	
	500003	K / L	500003K, L	
	500004	K / L	500004K, L	
	500006	K / L	500006K, L	
	500007	K / L	500007K, L	
	500008	K / L	500008K, L	
	500009	K / L	500009K, L	
	500010	K / L	500010K, L	
	570004	K / L	570004K, L	
	570007	K / L	570007K, L	
	600001	K / L	600001K, L	
	600015	K / L	600015K, L	
	BS94016	K / L	BS94016K, L	
	BS94017	K / L	BS94017K, L	
	BS96011	K / L	BS96011K, L	
	BS96012	K / L	BS96012K, L	
	BS96013	K / L	BS96013K, L	
	BS96023**	K / L	BS96023K, L	

CATALOG #	ANIMAL ID	MATRIX	SAMPLE #	QA/QC NOTES
7020048	195003	K / L	195003K, L	The following analytes did not meet QA/QC parameters:
	230001	K / L	230001K, L	
	BS96023A	Liver	BS96023A	PCB 8: 26.1% RPD (duplicates)
	BS96023A	Kidney	BS96023B	PCB 167: 155% RPD (duplicates)
	BS97011	K / L	BS97011K, L	PCB 74/88: 83.9% RPD(duplicates) -liver only
	BS97023	K / L	BS97023K, L	
	BS97030	K / L	BS97030K, L	
	BS98014	K / L	BS98014K, L	
	BS98019	K / L	BS98019K, L	
	BS98022	K / L	BS98022K, L	
	BS98026	K / L	BS98026K, L	
	BS98029	K / L	BS98029K, L	
	BS98030	K / L	BS98030K, L	
	BS98031	K / L	BS98031K, L	
	BS98032	K / L	BS98032K, L	
	BS98033	K / L	BS98033K, L	
	KL96003	K / L	KL96003K, L	
	RU98001	K / L	RU98001K, L	
	RU98002	K / L	RU98002K, L	
	YA96030	K / L	YA96030K, L	
7020054	140007	K / L	140007K, L	The following analytes did not meet QA/QC parameters:
	650002	K / L	650002K, L	
	BS96009	K / L	BS96009K, L	Hg: 64% spike recovery
	BS97012	K / L	BS97012K, L	PCB 28: 57% RPD (duplicates)
	BS97018	K / L	BS97018K, L	PCB 189: 65.1% spike recovery, 64.3% RPD (duplicates)
	BS97036	K / L	BS97036K, L	PCB 16 (livers only): 74.6% spike recovery, 91.8% RPD (duplicates)
	BS97044	K / L	BS97044K, L	PCB 10: 71% spike recovery 66.7% RPD (duplicates)
	BS97048	K / L	BS97048K, L	PCB 20/3: 78.6% spike recovery
	BS97057	K / L	BS97057K, L	
	BS98001	K / L	BS98001K, L	
	BS98006	K / L	BS98006K, L	
	BS98016	K / L	BS98016K, L	
	BS98028	K / L	BS98028K, L	
	BS98034	K / L	BS98034K, L	
	BS98036	K / L	BS98036K, L	
	PW96219	K / L	PW96219K, L	

Notes:

* No organochlorine analyses done on kidney tissue from this animal (elemental analyses only).

** Samples from this animal were eliminated from statistical analyses, since samples from same animal (renamed BS9696023A) were resubmitted in Catalog 7020048.

Appendix B. Elemental residues found in liver tissue of sea otters. Concentrations in ppm (mg/kg) dry wt.

Animal ID	Matrix	% moist	Al	As	B	Ba	Be	Cd	Cr	Cu	Fe	Hg
BS94001	Liver	67.2	<4.9801	<0.498	0.702	<0.498	<0.0996	24.78	<0.5976	49.7	507.6	1.04
BS94004	Liver	73.9	<5	1.22	1.92	0.5	0.1	6.425	0.8853	151.6	2015	6.277
BS94006	Liver	71.5	<5	1.16	1.29	<0.5	<0.1	11.97	<0.6	124.2	879.3	4.048
BS94007	Liver	68.4	<4.9603	3.38	1.11	<0.496	<0.0992	8.983	<0.5952	158.1	1312	9.303
BS94009	Liver	72.7	<4.9702	2.05	2.12	<0.497	<0.0994	10.06	<0.5964	154.9	1766	6.431
BS94010	Liver	69.4	<4.9801	0.518	1.26	<0.498	<0.0996	8.94	<0.5976	87.67	1894	8.788
BS94011	Liver	74.1	<4.8828	1.73	3.16	<0.498	<0.0977	13.47	0.7726	124.9	3836	3.443
BS94012	Liver	68.8	<4.99	0.948	2.06	<0.499	<0.0998	7.278	1.025	131.2	3264	6.085
BS94018	Liver	74	<5.02	0.872	<0.502	<0.502	<0.1	2.42	3.44	68.7	510	0.251
BS94019	Liver	71.2	<5.03	<0.51	1.18	<0.503	<0.101	<0.101	3.98	153	1003	0.234
BS94020	Liver	76.4	<5.05	<0.509	0.991	<0.505	<0.101	1.09	3.83	5.6	2004	0.534
BS94021	Liver	74	<5.09	1.4	1.18	<0.509	<0.102	7.46	5.19	4.29	2718	0.345
BS94022	Liver	39.3	<5.04	0.864	0.791	<0.504	<0.101	16.7	5.86	175	3345	0.665
480002	Liver	69.2	<5	0.914	<2	<1	<0.1	20.1	<0.5	94	693	1.21
480014	Liver	69.9	<5	0.661	<2	<1	<0.1	9.47	<0.5	36.1	427	1.82
480015	Liver	70.7	<5	1.2	<2	<1	<0.1	6.89	<0.5	58.7	1109	1.08
500001	Liver	70.5	<5	0.591	<2	<1	<0.1	7.24	<0.5	28.1	884	0.528
500003	Liver	69.3	<5	1.12	<2	<1	<0.1	3.68	<0.5	35.1	373	0.659
500004	Liver	69.6	<5	0.744	<2	<1	<0.1	5.64	<0.5	45.8	1160	0.245
500006	Liver	72.5	<5	1.09	<2	<1	0.13	5.76	<0.5	48.1	935	0.454
500007	Liver	69.5	<5	0.929	<2	<1	<0.1	2.6	<0.5	47.2	1015	1.09
500008	Liver	70.9	<5	0.53	<2	<1	<0.1	8.73	<0.5	48.9	1978	0.572
500009	Liver	70.8	5.68	0.505	<2	<1	<0.1	13.2	<0.5	61.9	556	1.35
500010	Liver	68.9	9.32	0.508	<2	<1	<0.1	6.8	0.56	66.7	1113	0.712
570004	Liver	72.2	<5	1.02	<2	<1	<0.1	6.55	<0.5	98.5	1546	1
570007	Liver	67.3	<5	1.01	<2	<1	<0.1	5.61	<0.5	69	880	1.03
600001	Liver	70	<5	1.1	<2	<1	0.1	2.08	0.56	91.4	3640	2.31
600015	Liver	70.7	<5	0.571	<2	<1	<0.1	3.74	<0.5	41.4	1743	1.47
BS94016	Liver	71.8	<5	1.72	<2	<1	<0.1	22.6	<0.5	82.2	400	4.65
BS94017	Liver	72.5	<5	1.46	<2	<1	<0.1	5.37	<0.5	48	452	1.81
BS96011	Liver	69.6	<5	0.505	<2	<1	<0.1	0.55	<0.5	78.9	441	0.308
BS96012	Liver	70.6	<5	1.11	<2	<1	0.11	4.95	<0.5	116	1039	5.4
BS96013	Liver	67.3	<5	0.938	<2	<1	<0.1	18.8	<0.5	38.4	556	3.01

Appendix B. Continued

Animal ID	Matrix	% moist	Al	As	B	Ba	Be	Cd	Cr	Cu	Fe	Hg
BS96023	Liver	69.4	<5	2.14	<2	<1	<0.1	5	<0.5	34.8	2787	1.87
195003	Liver	69.4	<5	0.769	<2	<1	<0.1	8.6	<0.5	123	1267	7.19
230001	Liver	73.1	<5	0.781	<2	<1	<0.1	1.9	<0.5	62.4	620	0.627
BS96023A	Liver	70.5	<5	1.45	<2	<1	<0.1	4.46	<0.5	33.4	2523	1.83
BS97011	Liver	70.4	<5	1.38	<2	<1	<0.1	7.96	0.82	54.1	726	1.34
BS97023	Liver	68.2	<5	1.47	<2	<1	<0.1	5.83	<0.5	71.6	802	0.899
BS97030	Liver	77.3	<5	2.15	<2	<1	<0.1	25.8	<0.5	85.4	2231	2.42
BS98014	Liver	69.8	<5	1.98	<2	<1	<0.1	3.04	<0.5	29.7	392	6.23
BS98019	Liver	69.6	<5	1.21	<2	<1	<0.1	3.47	<0.5	81.1	1245	1.32
BS98022	Liver	71.4	<5	0.831	<2	<1	<0.1	15.8	0.59	60	1051	0.846
BS98026	Liver	69.2	<5	1.07	<2	<1	<0.1	3.21	<0.5	77.8	509	3.16
BS98029	Liver	76.1	<5	<0.5	<2	<1	<0.1	1.74	<0.5	131	1384	0.452
BS98030	Liver	68.2	<5	0.739	<2	<1	<0.1	31	<0.5	81.6	700	0.389
BS98031	Liver	68.9	<5	2.96	<2	<1	<0.1	2.51	<0.5	50.5	1243	5.6
BS98032	Liver	75.1	<5	1.42	<2	<1	<0.1	11.6	<0.5	227	1804	15.7
BS98033	Liver	68.3	<5	0.703	<2	<1	<0.1	3.7	<0.5	51	1145	1.74
KL96003	Liver	72.1	<5	0.768	<2	<1	<0.1	4.13	<0.5	53.1	305	0.822
RU98001	Liver	71.5	<5	0.835	<2	<1	<0.1	26.6	<0.5	45.2	1198	1.12
RU98002	Liver	71.5	<5	0.616	<2	<1	<0.1	4.98	<0.5	26.6	1537	0.493
YA96030	Liver	69.7	<5	0.817	<2	<1	<0.1	3.26	<0.5	58.2	529	1.19
140007	Liver	72	<5	0.803	<2	<1	<0.1	2.73	<0.5	43	1898	1.74
650002	Liver	68.4	<5	<0.5	<2	<1	<0.1	1.71	<0.5	42.1	266	<0.2
BS96009	Liver	78.3	<5	1.49	<2	<1	<0.1	3.41	<0.5	104	1961	10.2
BS97012	Liver	69.6	<5	1.43	<2	<1	<0.1	6.41	<0.5	104	2062	1.97
BS97018	Liver	71	<5	1.26	<2	<1	<0.1	5	<0.5	89.6	3090	2.32
BS97036	Liver	66.8	<5	0.99	<2	<1	<0.1	10.9	<0.5	81.3	667	0.805
BS97044	Liver	70.6	<5	1.14	<2	<1	<0.1	3.82	<0.5	73.6	1093	1.25
BS97048	Liver	67.4	<5	0.894	<2	<1	<0.1	7.77	<0.5	51.3	736	1.76
BS97057	Liver	68.4	5.72	<0.5	<2	<1	<0.1	6.13	<0.5	92.2	588	1.16
BS98001	Liver	73.3	<5	0.897	<2	<1	<0.1	7.1	<0.5	83.2	1873	3.6
BS98006	Liver	71.3	<5	0.604	<2	<1	<0.1	2.89	<0.5	73.6	1707	12.8
BS98016	Liver	72.2	<5	0.77	<2	<1	<0.1	4.61	<0.5	43.9	687	1
BS98028	Liver	72.8	<5	0.627	<2	<1	<0.1	2.68	<0.5	28	1219	1.52
BS98034	Liver	70.4	<5	1.41	<2	<1	<0.1	1.68	<0.5	87.8	1396	1.03
BS98036	Liver	75.8	<5	0.64	<2	<1	<0.1	2.71	<0.5	91.6	1672	12.3
PW96219	Liver	68.8	<5	0.898	<2	<1	<0.1	3.35	<0.5	48.8	4501	5.18

Appendix B. Elemental residues found in liver tissue of sea otters (continued)

Animal ID	Matrix	% moist	Mg	Mn	Mo	Ni	Pb	Se	Sr	V	Zn
BS94001	Liver	67.2	803.9	18.14	1.271	<0.5976	0.6365	2.43	0.8162	<0.498	172.3
BS94004	Liver	73.9	724.6	15.96	1.358	<0.6	1.427	16.6	0.2591	<0.5	146.4
BS94006	Liver	71.5	745.4	18.78	1.235	<0.6	<0.6	9.62	0.2665	<0.5	215.4
BS94007	Liver	68.4	785.2	17.16	1.46	<0.5952	<0.5952	11.2	<0.1984	<0.498	230
BS94009	Liver	72.7	632.1	15.88	1.498	<0.5964	1.032	13.2	<0.1988	<0.497	187
BS94010	Liver	69.4	840.7	19.41	1.555	<0.5976	1.054	9.24	<0.1992	<0.498	174.8
BS94011	Liver	74.1	768.1	13.6	1.897	<0.5859	1.611	13.8	0.3236	<0.4883	197.5
BS94012	Liver	68.8	717.8	14.46	1.509	<0.5988	1.665	8.69	<0.1996	<0.499	223.4
BS94018	Liver	74	677	19	1.15	<0.502	<0.803	3.23	0.378	<0.502	220
BS94019	Liver	71.2	696	5.41	<0.503	0.671	<0.805	7.26	1.57	<0.503	199
BS94020	Liver	76.4	668	1.94	0.628	<0.505	<0.808	3.47	1.38	<0.505	101
BS94021	Liver	74	722	2.64	0.598	1.4	<0.815	16.6	1.4	<0.509	90.3
BS94022	Liver	39.3	602	28.3	1.58	1.24	<0.806	12.7	0.273	0.54	220
480002	Liver	69.2	710	13.6	<2	<0.5	<0.5	1.35	<0.5	<0.5	153
480014	Liver	69.9	609	11.9	<2	<0.5	<0.5	1.37	<0.5	0.93	125
480015	Liver	70.7	633	10.5	<2	<0.5	<0.5	1.58	<0.5	2.13	135
500001	Liver	70.5	587	10.6	<2	1.16	<0.5	1.4	<0.5	<0.5	113
500003	Liver	69.3	646	13.2	<2	<0.5	<0.5	1.52	<0.5	<0.5	110
500004	Liver	69.6	552	7.87	<2	1.21	<0.5	1.1	<0.5	<0.5	110
500006	Liver	72.5	540	10.4	<2	<0.5	<0.5	1.69	<0.5	<0.5	109
500007	Liver	69.5	685	8.99	<2	<0.5	<0.5	1.48	<0.5	<0.5	139
500008	Liver	70.9	664	9.83	<2	0.95	<0.5	1.18	<0.5	<0.5	126
500009	Liver	70.8	696	18.5	<2	<0.5	<0.5	1.89	<0.5	<0.5	158
500010	Liver	68.9	636	9.06	<2	<0.5	<0.5	1.42	<0.5	<0.5	141
570004	Liver	72.2	680	10.6	<2	0.64	<0.5	1.18	<0.5	<0.5	134
570007	Liver	67.3	613	10.4	<2	<0.5	<0.5	1.51	<0.5	<0.5	108
600001	Liver	70	681	13.2	<2	<0.5	<0.5	1.68	<0.5	<0.5	163
600015	Liver	70.7	797	12	<2	<0.5	<0.5	2	<0.5	<0.5	126
BS94016	Liver	71.8	762	13.5	<2	<0.5	<0.5	2.66	<0.5	<0.5	128
BS94017	Liver	72.5	614	14.4	<2	<0.5	<0.5	2.32	<0.5	<0.5	97.8
BS96011	Liver	69.6	557	8.12	<2	<0.5	<0.5	1.59	<0.5	<0.5	133
BS96012	Liver	70.6	589	11.1	<2	1.85	1.39	5.29	<0.5	<0.5	126
BS96013	Liver	67.3	544	11.5	<2	0.51	<0.5	2.84	<0.5	<0.5	113
BS96023	Liver	69.4	570	9.9	<2	<0.5	0.745	2.56	<0.5	<0.5	107
195003	Liver	69.4	600	11.8	<2	<0.5	<0.5	5.82	<0.5	1.23	155

Appendix B. Continued

Animal ID	Matrix	% moist	Mg	Mn	Mo	Ni	Pb	Se	Sr	V	Zn
230001	Liver	73.1	595	14.7	<2	<0.5	<0.5	3.17	<0.5	0.74	131
BS96023A	Liver	70.5	510	9.13	<2	<0.5	<0.5	4.3	<0.5	<0.5	110
BS97011	Liver	70.4	666	9.01	<2	<0.5	<0.5	2.97	<0.5	<0.5	142
BS97023	Liver	68.2	642	15.6	<2	<0.5	<0.5	2.87	<0.5	<0.5	129
BS97030	Liver	77.3	684	33.4	<2	<0.5	0.858	9.97	<0.5	<0.5	240
BS98014	Liver	69.8	620	8.99	<2	<0.5	<0.5	2.49	<0.5	<0.5	104
BS98019	Liver	69.6	596	15.7	<2	<0.5	<0.5	4.07	<0.5	2.25	110
BS98022	Liver	71.4	640	9.89	<2	<0.5	<0.5	3.36	<0.5	<0.5	115
BS98026	Liver	69.2	642	13.2	<2	<0.5	<0.5	6.23	<0.5	1.26	113
BS98029	Liver	76.1	724	27.5	<2	<0.5	0.796	2.36	<0.5	<0.5	211
BS98030	Liver	68.2	608	8.5	<2	<0.5	<0.5	1.68	<0.5	<0.5	141
BS98031	Liver	68.9	682	19.1	<2	<0.5	1.02	4.59	<0.5	2.42	116
BS98032	Liver	75.1	551	34.4	<2	<0.5	0.652	15.1	<0.5	0.96	214
BS98033	Liver	68.3	621	11	<2	<0.5	<0.5	2.71	<0.5	3.23	122
KL96003	Liver	72.1	719	16.6	<2	<0.5	<0.5	3.04	<0.5	<0.5	112
RU98001	Liver	71.5	543	8.72	<2	<0.5	<0.5	7.99	<0.5	<0.5	98.5
RU98002	Liver	71.5	493	6.87	<2	<0.5	<0.5	6.23	<0.5	<0.5	77.5
YA96030	Liver	69.7	624	14.9	<2	<0.5	<0.5	2.09	<0.5	1.12	111
140007	Liver	72	574	12.3	<2	0.63	<0.5	7.89	<0.5	2.43	97.4
650002	Liver	68.4	575	8.51	<2	<0.5	<0.5	2.47	<0.5	<0.5	119
BS96009	Liver	78.3	570	28.9	<2	<0.5	<0.5	16.7	0.58	<0.5	261
BS97012	Liver	69.6	587	8.75	<2	<0.5	0.791	6.93	<0.5	0.94	132
BS97018	Liver	71	546	9.38	<2	<0.5	1.5	8.89	<0.5	1.82	132
BS97036	Liver	66.8	624	12.3	<2	<0.5	<0.5	2.71	0.53	<0.5	126
BS97044	Liver	70.6	623	10.3	<2	<0.5	<0.5	2.9	0.59	<0.5	119
BS97048	Liver	67.4	598	10.5	<2	<0.5	<0.5	4.55	<0.5	1.34	130
BS97057	Liver	68.4	622	10.2	<2	<0.5	<0.5	3.9	<0.5	1.33	134
BS98001	Liver	73.3	621	21.8	<2	<0.5	<0.5	5.2	0.58	<0.5	207
BS98006	Liver	71.3	614	13.5	<2	<0.5	0.948	10.9	<0.5	<0.5	173
BS98016	Liver	72.2	618	9.35	<2	<0.5	<0.5	3.9	<0.5	0.62	103
BS98028	Liver	72.8	610	21.5	<2	<0.5	<0.5	6.21	<0.5	3.44	143
BS98034	Liver	70.4	543	8.67	<2	<0.5	<0.5	4.33	<0.5	2.62	114
BS98036	Liver	75.8	610	16	<2	<0.5	0.532	11.2	<0.5	<0.5	149
PW96219	Liver	68.8	572	12.9	<2	<0.5	0.898	7.54	<0.5	<0.5	113

Appendix C. Elemental residues found in kidney tissue of sea otters. Concentrations in ppm (mg/kg) dry wt.

Animal ID	Matrix	% moist	Al	As	B	Ba	Be	Cd	Cr	Cu	Fe	Hg
BS94001	Kidney	69.5	<4.7893	3.07	1.19	<0.4789	<0.0958	69.18	2.32	18.77	266.9	0.779
BS94018	Kidney	79.6	5.16	1.34	<0.502	<0.502	<0.1	5.05	10.1	16.9	488	0.243
BS94019	Kidney	73	<5.13	<0.504	0.827	<0.513	<0.103	<0.103	62.4	13.4	636	0.209
BS94020	Kidney	80.1	<4.99	2.21	0.768	<0.499	<0.0998	16	15.3	15.8	628	1.4
BS94021	Kidney	76.4	<5.04	0.916	0.622	<0.504	<0.101	176	1.57	15	644	0.727
BS94022	Kidney	49.3	7.96	1.34	0.522	<0.509	<0.102	179	20.2	14.7	857	0.725
480002	Kidney	67.3	<5	2.84	<2	<1	<0.1	91.4	<0.5	22.7	195	0.45
480014	Kidney	69.6	<5	1.18	<2	<1	<0.1	23.2	<0.5	15.3	344	0.639
480015	Kidney	75.6	<5	1.95	<2	<1	<0.1	27.6	<0.5	17.1	354	0.439
500001	Kidney	76.5	<5	1.19	<2	<1	<0.1	31.8	<0.5	20.2	578	0.551
500003	Kidney	74.5	<5	1.66	<2	<1	<0.1	6.5	<0.5	11.4	126	0.248
500004	Kidney	75.5	10.3	1.64	<2	<1	<0.1	20.9	<0.5	11.8	475	<0.2
500006	Kidney	75.6	<5	1.96	<2	<1	<0.1	16.2	<0.5	18.1	595	0.317
500007	Kidney	77.5	7.32	1.67	<2	<1	<0.1	28.6	<0.5	21	547	0.506
500008	Kidney	76.2	14.4	0.907	<2	<1	<0.1	52.9	0.54	16.4	459	0.433
500009	Kidney	76.6	<5	<0.5	<2	<1	<0.1	42.1	<0.5	15.2	578	1.17
500010	Kidney	74.5	5.64	1.87	<2	<1	<0.1	30.1	<0.5	15.2	476	0.529
570004	Kidney	53.9	<5	2.51	<2	<1	<0.1	13.6	<0.5	8	180	<0.2
570007	Kidney	53.5	<5	1.89	<2	<1	<0.1	7.85	<0.5	7.7	127	0.218
600001	Kidney	73.2	<5	2.4	<2	<1	<0.1	10.4	<0.5	18.2	357	0.865
600015	Kidney	69.7	<5	2.15	<2	<1	<0.1	9.5	<0.5	11.4	279	0.433
BS94016	Kidney	72.6	<5	1.95	<2	<1	<0.1	59.2	<0.5	16	459	1.25
BS94017	Kidney	76.5	<5	3.84	<2	<1	<0.1	16.3	<0.5	28	417	0.822
BS96011	Kidney	64.9	<5	1.26	<2	<1	<0.1	1.44	<0.5	11.3	217	<0.2
BS96012	Kidney	73.4	<5	1.78	<2	<1	<0.1	15.7	<0.5	13.8	494	0.91
BS96013	Kidney	72.4	<5	2.48	<2	<1	<0.1	48.4	<0.5	10.2	353	1.12
BS96023	Kidney	74.1	<5	4.02	<2	<1	<0.1	23.7	<0.5	11.8	424	0.826
195003	Kidney	75.7	<5	2.06	<2	<1	<0.1	27.5	<0.5	21.8	410	1.3
230001	Kidney	72.6	<5	3.04	<2	<1	<0.1	5.37	<0.5	17.7	422	0.231
BS96023A	Kidney	74	<5	3.8	<2	<1	<0.1	25.4	<0.5	14.4	507	0.935
BS97011	Kidney	71.4	<5	1.95	<2	<1	<0.1	40.4	<0.5	32	345	0.52
BS97023	Kidney	73.7	<5	4.14	<2	<1	<0.1	31.9	<0.5	19.6	315	0.503
BS97030	Kidney	81.3	<5	1.63	<2	<1	<0.1	214	1.08	28.1	1218	1.03
BS98014	Kidney	74.5	<5	3.93	<2	<1	<0.1	6.63	<0.5	16.3	572	4.66
BS98019	Kidney	75	<5	1.66	<2	<1	<0.1	17.9	0.52	26.6	497	0.819
BS98022	Kidney	77.2	<5	1.19	<2	<1	<0.1	66.8	<0.5	18.6	536	1.03

Appendix C. Continued

Animal ID	Matrix	% moist	Al	As	B	Ba	Be	Cd	Cr	Cu	Fe	Hg
BS98026	Kidney	76.6	<5	2.02	2.54	<1	<0.1	9.87	<0.5	29.8	327	1.61
BS98029	Kidney	79.4	<5	<0.5	<2	<1	<0.1	2.81	<0.5	26.8	695	0.234
BS98030	Kidney	74.1	<5	2.23	<2	<1	<0.1	71.6	<0.5	19.3	581	0.329
BS98031	Kidney	63.2	<5	2.73	<2	<1	<0.1	19.1	<0.5	15.4	201	1.44
BS98032	Kidney	81.8	<5	0.821	<2	<1	<0.1	33.4	<0.5	20	956	4.64
BS98033	Kidney	74.5	<5	2.29	<2	<1	<0.1	8.46	<0.5	12.3	392	0.856
KL96003	Kidney	75	<5	1.25	<2	<1	<0.1	16.4	<0.5	42.8	336	0.569
RU98001	Kidney	72.4	<5	2.17	<2	<1	<0.1	87.9	<0.5	18.4	533	0.61
RU98002	Kidney	73.9	<5	0.824	<2	<1	<0.1	14.9	<0.5	23.7	746	0.43
YA96030	Kidney	73.4	<5	1.89	<2	<1	<0.1	9.64	<0.5	21.9	308	0.631
140007	Kidney	77.6	<5	2.33	<2	<1	<0.1	22.2	<0.5	16	777	1.42
650002	Kidney	73.9	<5	1.47	<2	<1	<0.1	4.41	<0.5	20	141	<0.2
BS96009	Kidney	81.2	<5	2.36	<2	<1	<0.1	31.3	0.75	26.4	653	5.54
BS97012	Kidney	70.6	<5	4.44	<2	<1	<0.1	21	<0.5	15.7	373	0.849
BS97018	Kidney	69	<5	4.44	<2	<1	<0.1	20.4	<0.5	14.4	497	0.928
BS97036	Kidney	73.4	<5	3.55	<2	<1	<0.1	61.5	<0.5	23.8	274	0.426
BS97044	Kidney	72.5	<5	4.3	<2	<1	0.25	14.9	<0.5	19.4	290	0.527
BS97048	Kidney	74.8	<5	6.06	<2	<1	<0.1	20.3	<0.5	20.3	143	0.612
BS97057	Kidney	75.3	<5	2.84	<2	<1	<0.1	13.5	<0.5	19.8	438	0.83
BS98001	Kidney	78.1	<5	1.44	<2	<1	<0.1	23.7	<0.5	20.2	621	2.52
BS98006	Kidney	75.8	<5	3.26	<2	<1	<0.1	13.2	<0.5	25.2	531	3.47
BS98016	Kidney	72.8	<5	3.68	<2	<1	<0.1	11.4	<0.5	26.1	474	0.553
BS98028	Kidney	79.5	<5	1.47	<2	2.02	0.82	18.9	<0.5	24.4	779	2.23
BS98034	Kidney	67.9	<5	4.49	<2	<1	0.18	2.67	<0.5	13.3	265	0.352
BS98036	Kidney	80.9	<5	1.28	<2	<1	<0.1	37	<0.5	19.2	870	10.7
PW96219	Kidney	76.7	<5	1.86	<2	<1	<0.1	12.1	<0.5	14	682	2.94

Appendix C. Continued.

Animal ID	Matrix	% moist	Mg	Mn	Mo	Ni	Pb	Se	Sr	V	Zn
BS94001	Kidney	69.5	368.5	3.057	0.5032	<0.5747	0.986	5.51	0.224	<0.4789	93.89
BS94018	Kidney	79.6	603	3.82	0.599	4.42	<0.803	7.12	0.539	<0.502	104
BS94019	Kidney	73	509	7.8	0.895	2.85	<0.821	7.35	0.721	<0.513	64.4
BS94020	Kidney	80.1	567	4.5	0.85	1.25	<0.798	6.84	1.34	<0.499	122
BS94021	Kidney	76.4	525	3.53	<0.504	<0.504	<0.806	22.2	0.663	<0.504	119
BS94022	Kidney	49.3	475	6.12	0.718	2.22	<0.815	22.7	0.72	<0.509	143
480002	Kidney	67.3	382	3.12	<2	<0.5	<0.5	3.02	<0.5	1.89	110
480014	Kidney	69.6	380	3.17	<2	<0.5	<0.5	4.31	<0.5	<0.5	71.1
480015	Kidney	75.6	399	2.84	<2	<0.5	<0.5	4.3	<0.5	1.11	79.3
500001	Kidney	76.5	556	4.41	<2	1.14	<0.5	4.22	<0.5	<0.5	103
500003	Kidney	74.5	405	2.88	<2	0.53	<0.5	4.88	<0.5	<0.5	56.1
500004	Kidney	75.5	513	4.21	<2	<0.5	<0.5	2.97	<0.5	<0.5	78.1
500006	Kidney	75.6	473	3	<2	1.45	<0.5	2.84	<0.5	<0.5	80.6
500007	Kidney	77.5	549	3.91	<2	<0.5	<0.5	3.3	<0.5	<0.5	88.9
500008	Kidney	76.2	506	3.88	<2	<0.5	<0.5	2.56	<0.5	<0.5	109
500009	Kidney	76.6	670	7.61	<2	0.53	<0.5	3.45	<0.5	<0.5	124
500010	Kidney	74.5	553	4.59	<2	<0.5	<0.5	3.7	<0.5	<0.5	95.6
570004	Kidney	53.9	183	1.45	<2	<0.5	<0.5	0.888	<0.5	<0.5	38.4
570007	Kidney	53.5	177	1.38	<2	<0.5	<0.5	1.12	<0.5	<0.5	32
600001	Kidney	73.2	428	3.23	<2	<0.5	<0.5	3.38	<0.5	0.7	73.6
600015	Kidney	69.7	365	2.27	<2	<0.5	<0.5	3.1	<0.5	<0.5	57.1
BS94016	Kidney	72.6	437	2.33	<2	<0.5	<0.5	3.13	<0.5	<0.5	91.1
BS94017	Kidney	76.5	544	3.13	<2	<0.5	<0.5	4.4	<0.5	<0.5	83.4
BS96011	Kidney	64.9	319	2.28	<2	<0.5	<0.5	1.56	<0.5	<0.5	50.5
BS96012	Kidney	73.4	386	2.73	<2	0.87	<0.5	6.83	<0.5	<0.5	68.6
BS96013	Kidney	72.4	523	5.09	<2	1.4	0.518	4.95	0.72	<0.5	101
BS96023	Kidney	74.1	530	4.84	<2	<0.5	0.605	4.3	<0.5	<0.5	86.5
195003	Kidney	75.7	450	3.5	<2	0.514	<0.5	11.4	<0.5	3.87	96
230001	Kidney	72.6	367	2.63	<2	<0.5	<0.5	5.47	<0.5	<0.5	58.7
BS96023A	Kidney	74	601	5.27	<2	0.608	<0.5	9.54	<0.5	<0.5	104
BS97011	Kidney	71.4	534	4.26	<2	<0.5	<0.5	7.83	<0.5	1.04	105
BS97023	Kidney	73.7	452	3.25	<2	0.602	<0.5	4.62	<0.5	1.52	90.1
BS97030	Kidney	81.3	518	4.21	<2	1.33	<0.5	17.1	<0.5	2.31	215
BS98014	Kidney	74.5	550	6.79	<2	0.531	<0.5	6.44	<0.5	0.58	75.6
BS98019	Kidney	75	535	4.57	<2	0.631	<0.5	6.55	<0.5	2.38	105

Appendix C. Continued

Animal ID	Matrix	% moist	Mg	Mn	Mo	Ni	Pb	Se	Sr	V	Zn
BS98022	Kidney	77.2	435	3.48	<2	0.891	<0.5	7.77	<0.5	2.08	119
BS98026	Kidney	76.6	612	4.39	<2	0.742	<0.5	22.9	<0.5	2.85	93.6
BS98029	Kidney	79.4	472	4.48	<2	<0.5	<0.5	3.58	<0.5	<0.5	142
BS98030	Kidney	74.1	466	3.75	<2	<0.5	<0.5	4.9	<0.5	0.59	117
BS98031	Kidney	63.2	299	2.3	<2	<0.5	<0.5	6.61	<0.5	1.78	61.7
BS98032	Kidney	81.8	549	4.32	<2	0.544	<0.5	16.8	<0.5	2.29	151
BS98033	Kidney	74.5	524	6.66	<2	0.595	<0.5	9.68	<0.5	2.9	83.5
KL96003	Kidney	75	532	4.41	<2	<0.5	<0.5	9.02	<0.5	1.54	101
RU98001	Kidney	72.4	393	2.62	<2	<0.5	<0.5	7.36	<0.5	2.22	96.4
RU98002	Kidney	73.9	586	3.43	<2	0.605	<0.5	7.19	<0.5	2.52	98.5
YA96030	Kidney	73.4	531	4.13	<2	<0.5	<0.5	6.95	<0.5	3.2	86.3
140007	Kidney	77.6	542	3.87	<2	<0.5	<0.5	15.5	1.04	<0.5	96
650002	Kidney	73.9	549	3.52	<2	<0.5	<0.5	5.16	<0.5	0.53	73.4
BS96009	Kidney	81.2	555	5.18	<2	<0.5	<0.5	14.3	<0.5	0.61	208
BS97012	Kidney	70.6	392	3.19	<2	<0.5	<0.5	17.1	<0.5	<0.5	79.2
BS97018	Kidney	69	375	2.61	<2	<0.5	0.531	17	<0.5	<0.5	78.1
BS97036	Kidney	73.4	504	3.36	<2	<0.5	<0.5	5.62	0.58	1.24	100
BS97044	Kidney	72.5	469	3.86	<2	<0.5	<0.5	6.64	<0.5	1.99	71.9
BS97048	Kidney	74.8	319	2.5	<2	<0.5	<0.5	4.42	<0.5	<0.5	63.3
BS97057	Kidney	75.3	610	6.41	<2	<0.5	<0.5	8.05	<0.5	<0.5	84.9
BS98001	Kidney	78.1	611	4.34	<2	<0.5	<0.5	7.2	<0.5	<0.5	117
BS98006	Kidney	75.8	510	3.83	<2	<0.5	<0.5	12.1	<0.5	0.56	89.8
BS98016	Kidney	72.8	444	3.15	<2	<0.5	<0.5	8.36	0.68	<0.5	68.2
BS98028	Kidney	79.5	567	6.89	<2	1.72	<0.5	11	<0.5	4.4	109
BS98034	Kidney	67.9	368	2.88	<2	<0.5	<0.5	5.55	<0.5	1.32	50.8
BS98036	Kidney	80.9	603	3.55	<2	<0.5	<0.5	17.4	1.01	1.12	123
PW96219	Kidney	76.7	517	3.95	<2	<0.5	<0.5	16.1	0.67	1.37	84.2

Appendix D. Organochlorine residues found in liver tissue of sea otters (ppm, dry weight basis)

Appendix D. Continued

Animal ID	MATRIX	% Moisture	a-bhc	a-chlor	b-bhc	cis-non	d-bhc	dieeldrin	endrin	g-bhc	g-chlor	hcb	hept	mirex	op-ddd
BS97011	Liver	65.5	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029
BS97012	Liver	70.6	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034
BS97018	Liver	72.2	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036
BS97023	Liver	68.2	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314
BS97030	Liver	77.2	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439
BS97036	Liver	68	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312
BS97044	Liver	71.4	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035
BS97048	Liver	68.6	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318
BS97057	Liver	69.5	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328
BS98001	Liver	73.3	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375
BS98006	Liver	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357
BS98014	Liver	70	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333
BS98016	Liver	72.7	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366
BS98019	Liver	70	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333
BS98022	Liver	71.9	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356
BS98026	Liver	69.8	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331
BS98028	Liver	73.5	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377
BS98029	Liver	76.2	<0.042	<0.042	0.307	<0.042	<0.042	0.0756	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
BS98030	Liver	68.9	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322
BS98031	Liver	69.3	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326
BS98032	Liver	74.9	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398	<0.0398
BS98033	Liver	68.8	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321
BS98034	Liver	71.2	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347
BS98036	Liver	75.6	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041
KL96003	Liver	71.7	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353
BS94019	Liver	75	<0.04	<0.04	0.04	<0.04	<0.04	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
BS94018	Liver	77	<0.0435	<0.0435	0.2174	0.0435	<0.0435	0.0870	<0.0435	<0.0435	<0.0435	<0.0435	<0.0870	<0.0435	<0.0435
BS94022	Liver	78	<0.0455	<0.0455	0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455
BS94021	Liver	78	<0.0455	<0.0455	0.0909	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455
BS94020	Liver	80	<0.05	<0.05	0.15	0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
PW96219	Liver	69.6	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329
RU98001	Liver	72.1	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358
RU98002	Liver	71.2	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347
YA96030	Liver	69.9	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332

Appendix D. Continued

Animal ID	MATRIX	% Moisture	op-dde	op-ddt	oxy	pp-ddd	pp-dde	pp-ddt	1242	1248	1254	1260	PCBTOT	toxaph	transnon
140007	Liver	72.3	<0.0361	<0.0361	<0.0361	<0.0361	<0.0361	<0.0361	<0.0361	<0.0361	<0.0361	<0.0361	<0.181	<0.036	
195003	Liver	70.3	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.168	<0.168	<0.168	<0.168	<0.168	<0.034	
230001	Liver	72.8	<0.0368	<0.0368	<0.0368	<0.0368	<0.0368	<0.0368	<0.184	<0.184	<0.184	<0.184	<0.184	<0.037	
480002	Liver	71	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.172	<0.172	<0.172	<0.172	<0.172	<0.172	<0.035
480014	Liver	71	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.172	<0.172	<0.172	<0.172	<0.172	<0.172	<0.035
480015	Liver	71	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.172	<0.172	<0.172	<0.172	<0.172	<0.172	<0.035
500001	Liver	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.179	<0.179	<0.179	<0.179	<0.179	<0.179	<0.036
500003	Liver	70	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.167	<0.167	<0.167	<0.167	<0.167	<0.167	<0.033
500004	Liver	69	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	<0.161	<0.161	<0.161	<0.161	<0.161	<0.161	<0.032
500006	Liver	73	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.185	<0.185	<0.185	<0.185	<0.185	<0.185	<0.037
500007	Liver	71	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.172	<0.172	<0.172	<0.172	<0.172	<0.172	<0.035
500008	Liver	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.179	<0.179	<0.179	<0.179	<0.179	<0.179	<0.036
500009	Liver	73	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.185	<0.185	<0.185	<0.185	<0.185	<0.185	<0.037
500010	Liver	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.179	<0.179	<0.179	<0.179	<0.179	<0.179	<0.036
570004	Liver	73	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.185	<0.185	<0.185	<0.185	<0.185	<0.185	<0.037
570007	Liver	68	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.156	<0.156	<0.156	<0.156	<0.156	<0.156	<0.031
600001	Liver	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.179	<0.179	<0.179	<0.179	<0.179	<0.179	<0.036
600015	Liver	71	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.172	<0.172	<0.172	<0.172	<0.172	<0.172	<0.035
650002	Liver	69.5	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	-	<0.164	<0.033
BS94001	Liver	69	<0.03226	<0.03226	<0.03226	<0.03226	<0.03226	<0.03226	-	-	-	-	<0.161	<0.161	<0.032
BS94004	Liver	75.5	<0.04082	<0.04082	<0.04082	<0.04082	<0.04082	<0.04082	-	-	-	-	<0.204	<0.204	<0.041
BS94006	Liver	73	<0.03704	<0.03704	<0.03704	<0.03704	<0.03704	<0.03704	-	-	-	-	<0.185	<0.185	<0.037
BS94007	Liver	71	<0.03448	<0.03448	<0.03448	<0.03448	<0.03448	<0.03448	-	-	-	-	-	<0.172	<0.034
BS94009	Liver	74	<0.03846	<0.03846	<0.03846	<0.03846	<0.03846	<0.03846	-	-	-	-	<0.192	<0.192	<0.038
BS94010	Liver	71	<0.03448	<0.03448	<0.03448	<0.03448	<0.03448	<0.03448	-	-	-	-	<0.172	<0.172	<0.034
BS94011	Liver	74	<0.03846	<0.03846	<0.03846	<0.03846	<0.03846	<0.03846	-	-	-	-	<0.192	<0.192	<0.038
BS94012	Liver	70.5	<0.0339	<0.0339	<0.0339	<0.0339	<0.0339	<0.0339	-	-	-	-	<0.169	<0.169	<0.034
BS94016	Liver	73	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.185	<0.185	<0.185	<0.185	<0.185	<0.185	<0.037
BS94017	Liver	74	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.192	<0.192	<0.192	<0.192	<0.192	<0.192	<0.039
BS96009	Liver	78.5	<0.0465	<0.0465	<0.0465	<0.0465	0.34	<0.0465	<0.0465	<0.0465	0.512	0.158	-	<0.233	<0.135
BS96011	Liver	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.179	<0.179	<0.179	<0.179	<0.179	<0.179	<0.036
BS96012	Liver	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.179	<0.179	<0.179	<0.179	<0.179	<0.179	<0.036
BS96013	Liver	68	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.156	<0.156	<0.156	<0.156	<0.156	<0.156	<0.031
BS96023A	Liver	70.5	<0.0339	<0.0339	<0.0339	<0.0339	<0.0339	<0.0339	<0.169	<0.169	<0.169	<0.169	-	<0.169	<0.034

Appendix D. Continued

Animal ID	MATRIX	% Moisture	op-dde	op-ddt	oxy	pp-ddd	pp-dde	pp-ddt	1242	1248	1254	1260	PCBTOT	toxaph	transnon	
BS96023	Liver	71	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.172	<0.172	<0.172	<0.172	<0.172	<0.172	<0.035	
BS97011	Liver	65.5	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.145	<0.145	<0.145	<0.145	-	<0.145	<0.029	
BS97012	Liver	70.6	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	-	<0.170	<0.034	
BS97018	Liver	72.2	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	-	<0.180	<0.036	
BS97023	Liver	68.2	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.0314	<0.157	<0.157	<0.157	<0.157	-	<0.157	<0.031	
BS97030	Liver	77.2	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.0439	<0.219	<0.219	<0.219	0.421	-	<0.219	<0.044	
BS97036	Liver	68	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	-	<0.156	<0.031	
BS97044	Liver	71.4	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	-	<0.175	<0.035	
BS97048	Liver	68.6	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	<0.0318	-	<0.159	<0.0318	
BS97057	Liver	69.5	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	<0.0328	-	<0.164	<0.0328	
BS98001	Liver	73.3	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	-	<0.187	<0.0375	
BS98006	Liver	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	-	<0.179	<0.0357	
BS98014	Liver	70	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.167	<0.167	<0.167	<0.167	-	<0.167	<0.0333	
BS98016	Liver	72.7	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	-	<0.183	<0.0366	
BS98019	Liver	70	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.167	<0.167	<0.167	<0.167	-	<0.167	<0.0333	
BS98022	Liver	71.9	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.0356	<0.178	<0.178	<0.178	<0.178	-	<0.178	<0.0356	
BS98026	Liver	69.8	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.0331	<0.166	<0.166	<0.166	<0.166	-	<0.166	<0.0331	
BS98028	Liver	73.5	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	<0.0377	-	<0.189	<0.0377	
BS98029	Liver	76.2	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.21	<0.21	<0.21	<0.21	-	<0.21	0.0420	
BS98030	Liver	68.9	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.0322	<0.161	<0.161	<0.161	<0.161	-	<0.161	<0.0322	
BS98031	Liver	69.3	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.163	<0.163	<0.163	<0.163	-	<0.163	<0.0326	
BS98032	Liver	74.9	<0.0398	<0.0398	<0.0398	<0.0398	0.438	<0.0398	<0.199	<0.199	<0.199	0.518	0.283	-	<0.199	0.175
BS98033	Liver	68.8	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.0321	<0.16	<0.16	<0.16	<0.16	-	<0.16	<0.0321	
BS98034	Liver	71.2	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	-	<0.174	<0.0347	
BS98036	Liver	75.6	<0.041	<0.041	<0.041	<0.041	0.217	<0.041	<0.041	<0.041	<0.041	0.176	<0.041	-	<0.205	0.0574
KL96003	Liver	71.7	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.0353	<0.177	<0.177	<0.177	<0.177	-	<0.177	<0.0353	
BS94019	Liver	75	<0.04	<0.04	<0.04	<0.04	<0.04	0.08	<0.04	-	-	-	2.36	<0.2	0.04	
BS94018	Liver	77	<0.0435	<0.0435	0.0435	0.0435	0.1739	<0.0435	-	-	-	-	24.3478	<0.2174	0.1304	
BS94022	Liver	78	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	0.0455	<0.0455	-	-	-	1.9545	<0.2273	0.0455	
BS94021	Liver	78	<0.0455	<0.0455	0.0455	<0.0455	0.0455	<0.0455	-	-	-	-	8.1818	<0.2273	<0.0455	
BS94020	Liver	80	<0.05	<0.05	0.05	0.05	0.5	<0.05	-	-	-	-	2.45	<0.25	<0.05	
PW96219	Liver	69.6	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	<0.0329	-	<0.164	<0.0329	
RU98001	Liver	72.1	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.0358	<0.179	<0.179	<0.179	<0.179	-	<0.179	<0.0358	
RU98002	Liver	71.2	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.174	<0.174	<0.174	<0.174	-	<0.174	<0.0347	
YA96030	Liver	69.9	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.0332	<0.166	<0.166	<0.166	<0.166	-	<0.166	<0.0332	

Appendix E. Organochlorine residues found in kidney tissue of sea otters (ppm, dry weight)

Animal ID	MATRIX	% Moisture	a-bhc	a-chlor	b-bhc	cis-non	d-bhc	dieldrin	endrin	g-bhc	g-chlor	hcb	hept	mirex	op-ddd
140007	Kidney	76.7	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429
195003	Kidney	76.6	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427
230001	Kidney	73.1	<0.0372	<0.0372	0.0743	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372
480002	Kidney	63	<0.027	<0.027	0.0541	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027
480014	Kidney	66	<0.0294	<0.0294	0.05	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294
480015	Kidney	76	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
500001	Kidney	78	<0.0455	<0.0455	0.109	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455
500003	Kidney	74	<0.0385	<0.0385	0.112	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385
500004	Kidney	76	<0.0417	<0.0417	0.0833	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
500006	Kidney	77	<0.0435	<0.0435	0.0565	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435
500007	Kidney	77	<0.0435	<0.0435	0.087	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435
500008	Kidney	76	<0.0417	<0.0417	0.0458	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
500009	Kidney	77	<0.0435	<0.0435	0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435
500010	Kidney	76	<0.0417	<0.0417	0.0458	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
570004	Kidney	44	<0.0179	<0.0179	0.0357	<0.0179	<0.0179	<0.0179	<0.0179	<0.0179	<0.0179	<0.0179	<0.0179	<0.0179	<0.0179
570007	Kidney	52	<0.0208	<0.0208	0.0583	<0.0208	<0.0208	<0.0208	<0.0208	<0.0208	<0.0208	<0.0208	<0.0208	<0.0208	<0.0208
600001	Kidney	74	<0.0385	<0.0385	0.0885	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385
600015	Kidney	71	<0.0345	<0.0345	0.0379	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345
650002	Kidney	72.7	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366
BS94016	Kidney	74	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385
BS94017	Kidney	78	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455
BS96009	Kidney	80.9	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524	<0.0524
BS96011	Kidney	63	<0.027	<0.027	0.0432	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027
BS96012	Kidney	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357
BS96013	Kidney	73	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037
BS96023A	Kidney	74.6	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394
BS96023	Kidney	76	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
BS97011	Kidney	74.1	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386
BS97012	Kidney	70.9	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344
BS97018	Kidney	70.3	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337
BS97023	Kidney	75.4	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407
BS97030	Kidney	81.4	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538
BS97036	Kidney	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357
BS97044	Kidney	73.1	<0.0372	<0.0372	0.0595	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372
BS97048	Kidney	65.5	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029
BS97057	Kidney	75.6	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041

Appendix E. Continued

Animal ID	MATRIX	% Moisture	a-bhc	a-chlor	b-bhc	cis-non	d-bhc	dieldrin	endrin	g-bhc	g-chlor	hcb	hept	mirex	op-ddd
BS98001	Kidney	78.4	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463
BS98006	Kidney	75.3	<0.0405	<0.0405	0.0486	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405
BS98014	Kidney	76.2	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
BS98016	Kidney	72.5	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364
BS98019	Kidney	74.7	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395
BS98022	Kidney	75.1	<0.0402	<0.0402	0.0482	<0.0402	<0.0402	<0.0402	<0.0402	<0.0402	<0.0402	<0.0402	<0.0402	<0.0402	<0.0402
BS98026	Kidney	76.8	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431
BS98028	Kidney	78.3	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461
BS98029	Kidney	79.3	<0.0483	<0.0483	0.184	<0.0483	<0.0483	0.0773	<0.0483	<0.0483	<0.0483	<0.0483	<0.0483	<0.0483	<0.0483
BS98030	Kidney	73.8	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382
BS98031	Kidney	66	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294
BS98032	Kidney	80.3	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508
BS98033	Kidney	75.4	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407
BS98034	Kidney	66	<0.0294	<0.0294	0.0559	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294
BS98036	Kidney	80.6	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515
KL96003	Kidney	74.6	<0.0394	<0.0394	0.0512	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394
BS94019	Kidney	80	<0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
BS94018	Kidney	82	<0.05556	<0.05556	0.166667	<0.05556	<0.05556	0.111111	<0.05556	<0.05556	<0.05556	<0.05556	0.055556	<0.05556	<0.05556
BS94022	Kidney	81	<0.05263	<0.05263	0.052632	<0.05263	<0.05263	<0.05263	<0.05263	<0.05263	<0.05263	<0.05263	<0.05263	<0.05263	<0.05263
BS94021	Kidney	78	<0.04545	<0.04545	0.045455	<0.04545	<0.04545	<0.04545	<0.04545	<0.04545	<0.04545	<0.04545	<0.04545	<0.04545	<0.04545
BS94020	Kidney	83	<0.05882	<0.05882	0.058824	<0.05882	<0.05882	<0.05882	<0.05882	<0.05882	<0.05882	<0.05882	<0.05882	<0.05882	<0.05882
PW96219	Kidney	77.7	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448
RU98001	Kidney	72.7	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366
RU98002	Kidney	73.3	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375
YA96030	Kidney	70	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333

Appendix E. Continued

Animal ID	MATRIX	% Moisture	op-dde	op-ddt	oxy	pp-ddd	pp-dde	pp-ddt	PCB1242	PCB1248	PCB1254	PCB1260	PCBTOT	toxaph	transnon
140007	Kidney	76.7	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	<0.0429	-	<0.215	<0.0429
195003	Kidney	76.6	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.0427	<0.214	<0.214	<0.214	<0.214	-	<0.214	<0.0427
230001	Kidney	73.1	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.186	<0.186	<0.186	<0.186	-	<0.186	<0.0372
480002	Kidney	63	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.135	<0.135	<0.135	<0.135	<0.135	<0.135	<0.027
480014	Kidney	66	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.147	<0.147	<0.147	<0.147	<0.147	<0.147	<0.0294
480015	Kidney	76	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.208	<0.208	<0.208	<0.208	<0.208	<0.208	<0.0417
500001	Kidney	78	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.0455	<0.227	<0.227	<0.227	<0.227	<0.227	<0.227	<0.0455
500003	Kidney	74	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.192	<0.192	<0.192	<0.192	<0.192	<0.192	<0.0385
500004	Kidney	76	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.208	<0.208	<0.208	<0.208	<0.208	<0.208	<0.0417
500006	Kidney	77	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.217	<0.217	<0.217	<0.217	<0.217	<0.217	<0.0435
500007	Kidney	77	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.217	<0.217	<0.217	<0.217	<0.217	<0.217	<0.0435
500008	Kidney	76	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.208	<0.208	<0.208	<0.208	<0.208	<0.208	<0.0417
500009	Kidney	77	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.0435	<0.217	<0.217	<0.217	<0.217	<0.217	<0.217	<0.0435
500010	Kidney	76	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.208	<0.208	<0.208	<0.208	<0.208	<0.208	<0.0417
570004	Kidney	44	<0.0179	<0.0179	<0.0179	<0.0179	<0.0179	<0.0179	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0179
570007	Kidney	52	<0.0208	<0.0208	<0.0208	<0.0208	<0.0208	<0.0208	<0.104	<0.104	<0.104	<0.104	<0.104	<0.104	<0.0208
600001	Kidney	74	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.192	<0.192	<0.192	<0.192	<0.192	<0.192	<0.0385
600015	Kidney	71	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.0345	<0.172	<0.172	<0.172	<0.172	<0.172	<0.172	<0.0345
650002	Kidney	72.7	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	-	<0.183	<0.0366
BS94016	Kidney	74	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.0385	<0.192	<0.192	<0.192	<0.192	<0.192	<0.192	<0.0385
BS94017	Kidney	78	<0.0455	<0.0455	<0.0455	<0.0455	0.0909	<0.0455	<0.227	<0.227	<0.227	<0.227	<0.227	<0.227	<0.0455
BS96009	Kidney	80.9	<0.0524	<0.0524	<0.0524	<0.0524	0.209	<0.0524	<0.0524	<0.0524	0.225	<0.0524	-	<0.262	0.0942
BS96011	Kidney	63	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027	<0.135	<0.135	<0.135	<0.135	<0.135	<0.135	<0.027
BS96012	Kidney	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.179	<0.179	<0.179	<0.179	<0.179	<0.179	<0.0357
BS96013	Kidney	73	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.185	<0.185	<0.185	<0.185	<0.185	<0.185	<0.037
BS96023A	Kidney	74.6	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.197	<0.197	<0.197	<0.197	-	<0.197	<0.0394
BS96023	Kidney	76	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.208	<0.208	<0.208	<0.208	<0.208	<0.208	<0.0417
BS97011	Kidney	74.1	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.0386	<0.193	<0.193	<0.193	<0.193	-	<0.193	<0.0386
BS97012	Kidney	70.9	<0.0344	<0.0344	<0.0344	<0.0344	0.0412	<0.0344	<0.0344	<0.0344	<0.0344	<0.0344	-	<0.0344	<0.172
BS97018	Kidney	70.3	<0.0337	<0.0337	<0.0337	<0.0337	<0.0337	0.0438	<0.0337	<0.0337	<0.0337	<0.0337	-	<0.168	<0.0337
BS97023	Kidney	75.4	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.203	<0.203	<0.203	<0.203	-	<0.203	<0.0407
BS97030	Kidney	81.4	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.0538	<0.269	<0.269	<0.269	<0.269	-	<0.269	<0.0538
BS97036	Kidney	72	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	<0.0357	-	<0.179	<0.0357
BS97044	Kidney	73.1	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	<0.0372	-	<0.186	<0.0372
BS97048	Kidney	65.5	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	-	<0.145	<0.029

Appendix E. Continued

Animal ID	MATRIX	% Moisture	op-dde	op-ddt	oxy	pp-ddd	pp-dde	pp-ddt	PCB1242	PCB1248	PCB1254	PCB1260	PCBTOT	toxaph	transnon
BS97057	Kidney	75.6	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	-	<0.205	<0.041
BS98001	Kidney	78.4	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	<0.0463	-	<0.231	<0.0463
BS98006	Kidney	75.3	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	<0.0405	-	<0.202	<0.0405
BS98014	Kidney	76.2	<0.042	<0.042	<0.042	<0.042	0.0588	<0.042	<0.21	<0.21	<0.21	<0.21	-	<0.21	<0.042
BS98016	Kidney	72.5	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	<0.0364	-	<0.182	<0.0364
BS98019	Kidney	74.7	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.0395	<0.198	<0.198	<0.198	<0.198	-	<0.198	<0.0395
BS98022	Kidney	75.1	<0.0402	<0.0402	<0.0402	<0.0402	<0.0402	<0.0402	<0.201	<0.201	<0.201	<0.201	-	<0.201	<0.0402
BS98026	Kidney	76.8	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.0431	<0.216	<0.216	<0.216	<0.216	-	<0.216	<0.0431
BS98028	Kidney	78.3	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.0461	<0.461	<0.461	<0.461	<0.461	-	<0.23	<0.0461
BS98029	Kidney	79.3	<0.0483	<0.0483	<0.0483	<0.0483	<0.0483	<0.0483	<0.242	<0.242	<0.242	<0.242	-	<0.242	<0.0483
BS98030	Kidney	73.8	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.0382	<0.191	<0.191	<0.191	<0.191	-	<0.191	<0.0382
BS98031	Kidney	66	<0.0294	<0.0294	<0.0294	<0.0294	0.0912	<0.0294	<0.147	<0.147	0.324	0.324	-	<0.147	0.0324
BS98032	Kidney	80.3	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.0508	<0.254	<0.254	<0.254	<0.254	-	<0.254	<0.0508
BS98033	Kidney	75.4	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.0407	<0.203	<0.203	<0.203	<0.203	-	<0.203	<0.0407
BS98034	Kidney	66	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	<0.0294	-	<0.147	<0.0294
BS98036	Kidney	80.6	<0.0515	<0.0515	<0.0515	<0.0515	<0.0515	0.0876	<0.0515	<0.0515	<0.0515	<0.0515	-	<0.258	<0.0515
KL96003	Kidney	74.6	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.0394	<0.197	<0.197	<0.197	<0.197	-	<0.197	<0.0394
BS94019	Kidney	80	<0.05	<0.05	0.05	0.05	0.15	<0.05	-	-	-	-	3.9	<0.25	0.1
BS94018	Kidney	82	<0.05556	<0.05556	0.055556	<0.05556	0.166667	<0.05556	-	-	-	-	19.44444	<0.27778	0.055556
BS94022	Kidney	81	<0.05263	<0.05263	<0.05263	<0.05263	<0.05263	<0.05263	-	-	-	-	0.894737	<0.26316	<0.05263
BS94021	Kidney	78	<0.04545	<0.04545	<0.04545	<0.04545	0.045455	<0.04545	-	-	-	-	6.818182	<0.22727	<0.04545
BS94020	Kidney	83	<0.05882	<0.05882	<0.05882	<0.05882	0.117647	<0.05882	-	-	-	-	0.647059	<0.29412	0.058824
PW96219	Kidney	77.7	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	<0.0448	-	<0.224	<0.0448
RU98001	Kidney	72.7	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.0366	<0.183	<0.183	<0.183	<0.183	-	<0.183	<0.0366
RU98002	Kidney	73.3	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.0375	<0.187	<0.187	<0.187	<0.187	-	<0.187	<0.0375
YA96030	Kidney	70	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.167	<0.167	<0.167	<0.167	-	<0.167	<0.0333

Appendix F1. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in mg/kg (ppm) dry weight basis.

Animal ID	MATRIX	% Lipid	% Moisture	PCB # 10	PCB # 101	PCB # 105	PCB # 105/141	PCB # 110	PCB # 114	PCB # 118	PCB # 123	PCB # 126	PCB # 128	PCB # 132	PCB # 137
140007	Kidney	2.74	76.7	<0.00004		0.0001		0.0016	0.00005	0.00009	0.00018	0.00005	0.00006	-	-
140007	Liver	0.763	72.3	0.00004		0.00047		0.001	0.00005	0.0017	0.00013	0.00004	0.001	-	-
195003	Kidney	4.7	76.6	-	0.001	-	0.0024	-	-	0.0019	-	<0.00009	0.0014	<0.00009	0.001
195003	Liver	1.82	70.3	-	0.00044	-	0.001	-	-	0.001	-	0.00015	0.00031	0.00012	0.001
230001	Kidney	5.21	73.1	-	0.0017	-	0.0017	-	-	0.0022	-	<0.00007	0.001	0.00010	0.001
230001	Liver	1.09	72.8	-	0.001	-	<0.00007	-	-	0.001	-	<0.00007	0.00018	0.0011	0.001
480002	Kidney	11	63	-	<0.001	-	<0.001	-	-	<0.001	-	<0.001	<0.001	<0.001	-
480002	Liver	2.28	71	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
480014	Kidney	9.8	66	-	<0.001	-	0.0017	-	-	0.0053	-	0.0019	<0.001	<0.001	-
480014	Liver	2.21	71	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
480015	Kidney	5.75	76	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
480015	Liver	1.9	71	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500001	Kidney	2.5	78	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500001	Liver	1.41	72	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500003	Kidney	6.36	74	-	<0.002	-	0.0036	-	-	0.0022	-	<0.002	<0.002	<0.002	-
500003	Liver	2.41	70	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500004	Kidney	3.54	76	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500004	Liver	1.29	69	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500006	Kidney	2.96	77	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500006	Liver	2.13	73	-	<0.002	-	<0.002	-	-	0.0019	-	<0.002	<0.002	<0.002	-
500007	Kidney	2.31	77	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500007	Liver	1.55	71	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500008	Kidney	3.5	76	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500008	Liver	1.3	72	-	<0.002	-	<0.002	-	-	0.0019	-	<0.002	<0.002	<0.002	-
500009	Kidney	0.67	77	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500009	Liver	1.3	73	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500010	Kidney	4.78	76	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
500010	Liver	2.12	72	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
570004	Kidney	33.3	44	-	<0.00089	-	<0.0009	-	-	<0.0009	-	<0.0009	<0.0009	<0.0009	-
570004	Liver	2.07	73	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-

Appendix F1. Continued

Animal ID	MATRIX	% Lipid	% Moisture	PCB # 10	PCB # 101	PCB # 105	PCB # 105/141	PCB # 110	PCB # 114	PCB # 118	PCB # 123	PCB # 126	PCB # 128	PCB # 132	PCB # 137
570007	Kidney	25	52	-	<0.001	-	<0.001	-	-	<0.001	-	<0.001	<0.001	<0.001	-
570007	Liver	2.02	68	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
600001	Kidney	6.28	74	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
600001	Liver	2.67	72	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
600015	Kidney	13.2	71	-	0.0031	-	0.0018	-	-	0.0029	-	<0.002	<0.002	<0.002	-
600015	Liver	2.08	71	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
650002	Kidney	5.57	72.7	<0.00004	-	0.0022	-	0.001	0.00018	0.0088	0.0011	0.00004	0.0032	-	-
650002	Liver	1.23	69.5	0.00005	-	0.0003	-	0.0003	0.00003	0.001	0.00013	0.00003	0.00036	-	-
BS94001	Liver	1.85	69	-	-	-	-	-	-	-	-	-	-	-	-
BS94004	Liver	1.93	75.5	-	-	-	-	-	-	-	-	-	-	-	-
BS94006	Liver	2.2	73	-	-	-	-	-	-	-	-	-	-	-	-
BS94009	Liver	2.08	74	-	-	-	-	-	-	-	-	-	-	-	-
BS94010	Liver	2.23	71	-	-	-	-	-	-	-	-	-	-	-	-
BS94011	Liver	2.01	74	-	-	-	-	-	-	-	-	-	-	-	-
BS94012	Liver	2.66	70.5	-	-	-	-	-	-	-	-	-	-	-	-
BS94016	Kidney	9.16	74	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS94016	Liver	1.71	73	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS94017	Kidney	2.4	78	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS94017	Liver	1.6	74	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS94018	Kidney	1.41	82	-	-	-	-	-	-	-	-	-	-	-	-
BS94018	Liver	1.64	77	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Kidney	4.38	80	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Liver	4.37	75	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Kidney	1.38	83	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Liver	2.44	80	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Kidney	1.31	78	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Liver	1.63	78	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Kidney	1.36	81	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Liver	2.01	78	-	-	-	-	-	-	-	-	-	-	-	-
BS96009	Kidney	0.353	80.9	-	-	0.0033	-	0.0011	0.0002	0.0136	0.001	0.00005	0.0048	-	-
BS96009	Liver	0.731	78.5	-	-	0.0121	-	0.0022	0.001	0.0512	0.0035	0.00007	0.0181	-	-

Appendix F1. Continued

Animal ID	MATRIX	% Lipid	% Moisture	PCB # 10	PCB # 101	PCB # 105	PCB # 105/141	PCB # 110	PCB # 114	PCB # 118	PCB # 123	PCB # 126	PCB # 128	PCB # 132	PCB # 137
BS96011	Kidney	15.6	63	-	<0.001	-	<0.001	-	-	<0.001	-	<0.001	<0.001	<0.001	-
BS96011	Liver	3.84	72	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS96012	Kidney	4.59	72	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS96012	Liver	2.22	72	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS96013	Kidney	3.39	73	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS96013	Liver	3.04	68	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS96023	Kidney	1.88	76	-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-
BS96023	Liver	2.16	71	-	0.0079	-	0.0079	-	-	0.0097	-	<0.002	0.0245	0.0038	-
BS96023A	Liver	2.51	70.5	-	0.001	-	0.0005	-	-	0.001	-	<0.00007	0.0004	0.001	0.001
BS96023A	Kidney	1.74	74.6	-	0.0013	-	0.0022	-	-	0.0018	-	<0.00008	0.001	0.001	0.001
BS97011	Kidney	7.88	74.1	-	0.0021	-	0.0021	-	-	0.0027	-	<0.00008	0.001	0.0002	0.0013
BS97011	Liver	2.03	65.5	-	0.0002	-	0.0012	-	-	0.0013	-	<0.00006	0.0002	0.0001	<0.00006
BS97012	Kidney	14.2	70.9	<0.00003	-	0.0011	-	0.001	0.0001	0.0055	0.0004	0.0006	0.0022	-	-
BS97012	Liver	0.848	70.6	0.00003	-	0.00014	-	0.0003	0.00003	0.001	0.00003	0.0004	0.0002	-	-
BS97018	Kidney	13.9	70.3	<0.00003	-	0.0021	-	0.0011	0.0003	0.0101	0.001	0.0003	0.004	-	-
BS97018	Liver	0.982	72.2	0.00004	-	0.00020	-	0.0004	0.00004	0.001	0.00004	0.0004	0.0003	-	-
BS97023	Kidney	4.01	75.4	-	0.001	-	<0.00008	-	-	0.0012	-	<0.00008	<0.00008	<0.0001	<0.00008
BS97023	Liver	2.51	68.2	-	0.0003	-	0.0013	-	-	0.0017	-	0.00008	0.0003	0.0002	0.00008
BS97030	Kidney	0.362	81.4	-	0.0013	-	0.0023	-	-	0.0027	-	0.00015	0.0012	0.0001	0.0018
BS97030	Liver	1.52	77.2	-	0.0048	-	0.0043	-	-	0.0092	-	<0.00009	0.0038	0.0001	0.0015
BS97036	Kidney	7.74	72	<0.00004	-	0.00015	-	0.0003	0.00004	0.0005	0.00004	0.00004	0.0001	-	-
BS97036	Liver	1.34	68	0.00003	-	0.00014	-	0.0004	0.00003	0.0004	0.00003	0.00003	0.0001	-	-
BS97044	Kidney	7.2	73.1	<0.00004	-	0.0012	-	0.0021	0.00009	0.0056	0.001	0.00004	0.0023	-	-
BS97044	Liver	1.4	71.4	0.00004	-	0.00024	-	0.001	0.00004	0.001	0.00008	0.00004	0.0003	-	-
BS97048	Kidney	14.5	65.5	0.00003	-	0.0018	-	0.0035	0.0001	0.0064	0.001	0.00003	0.0028	-	-
BS97048	Liver	2	68.6	0.00003	-	0.00032	-	0.001	0.00003	0.001	0.0001	0.00003	0.0004	-	-
BS97057	Kidney	2.15	75.6	0.00004	-	0.00005	-	0.0023	0.00012	0.0025	0.00008	0.00007	0.00005	-	-
BS97057	Liver	0.934	69.5	0.00003	-	0.00019	-	0.001	0.00003	0.001	0.00003	0.00003	0.00003	-	-
BS98001	Kidney	0.479	78.4	0.00005	-	0.00040	-	0.0004	0.00005	0.0016	0.0001	0.00005	0.0004	-	-

Appendix F1. Continued

Animal ID	MATRIX	% Lipid	% Moisture	PCB # 10	PCB # 101	PCB # 105	PCB # 105/141	PCB # 110	PCB # 114	PCB # 118	PCB # 123	PCB # 126	PCB # 128	PCB # 132	PCB # 137
BS98001	Liver	0.728	73.3	0.00004	-	0.001	-	0.0004	0.00004	0.002	0.0001	0.00004	0.001	-	-
BS98006	Kidney	3.23	75.3	0.00004	-	0.001	-	0.0012	0.00007	0.0032	0.0003	0.00005	0.0012	-	-
BS98006	Liver	0.779	72	0.00004	-	0.00025	-	0.001	0.00004	0.001	0.00009	0.00004	0.0003	-	-
BS98014	Kidney	1.97	76.2	-	0.0067	-	0.0059	-	-	0.008	-	<0.00008	0.002	0.0004	0.0013
BS98014	Liver	1.82	70	-	0.0037	-	0.0015	-	-	0.001	-	-0.00007	0.001	0.0004	0.001
BS98016	Kidney	9.47	72.5	0.00004	-	0.0016	-	0.001	0.00011	0.0066	0.001	0.00004	0.0027	-	-
BS98016	Liver	0.976	72.7	0.00004	-	0.001	-	0.0005	0.00004	0.0018	0.00009	0.00004	0.001	-	-
BS98019	Kidney	2.21	74.7	-	<0.00008	-	<0.00008	-	-	<0.00008	-	<0.00008	0.0004	0.0011	0.0001
BS98019	Liver	1.86	70	-	0.001	-	<0.00007	-	-	0.0004	-	<0.00007	<0.00007	0.0002	<0.0001
BS98022	Kidney	3.34	75.1	-	0.0011	-	0.001	-	-	0.0012	-	<0.00008	0.0003	0.0002	<0.0001
BS98022	Liver	2.6	71.9	-	0.001	-	0.003	-	-	0.0031	-	<0.00007	0.0002	0.0002	0.0003
BS98026	Kidney	1.69	76.8	-	0.0033	-	0.0039	-	-	0.0038	-	<0.00009	0.0014	0.001	0.0004
BS98026	Liver	1.76	69.8	-	0.0011	-	0.0019	-	-	0.0017	-	<0.00007	0.001	0.0001	0.0001
BS98028	Kidney	0.998	78.3	0.00005	-	0.00005	-	0.002	0.00005	0.00005	0.00005	0.00005	0.00005	-	-
BS98028	Liver	0.623	73.5	0.00004	-	0.00017	-	0.0003	0.00004	0.001	0.00006	0.00004	0.0001	-	-
BS98029	Kidney	0.648	79.3	-	0.0077	-	0.0044	-	-	0.0101	-	<0.00010	0.0016	0.0004	0.001
BS98029	Liver	1.25	76.2	-	0.0097	-	0.0032	-	-	0.0059	-	0.00025	0.0015	0.0015	0.001
BS98030	Kidney	3.28	73.8	-	<0.00008	-	<0.00008	-	-	0.0011	-	<0.00008	0.0003	0.0002	0.001
BS98030	Liver	2.23	68.9	-	0.001	-	0.001	-	-	0.0013	-	<0.00006	0.0002	0.0011	0.0002
BS98031	Kidney	21.6	66	-	0.0197	-	0.0165	-	-	0.0256	-	0.00020	0.0068	0.0032	0.0019
BS98031	Liver	2.65	69.3	-	0.0019	-	0.0017	-	-	0.0025	-	<0.00007	0.001	0.001	0.001
BS98032	Kidney	0.276	80.3	-	0.0017	-	0.0015	-	-	0.002	-	<0.00010	0.001	0.0002	0.0001
BS98032	Liver	2.85	74.9	-	0.0757	-	0.0195	-	-	0.0717	-	<0.00008	0.0151	0.0032	0.0052
BS98033	Kidney	2.28	75.4	-	0.00049	-	<0.00008	-	-	0.001	-	<0.00008	0.001	0.0001	0.0011
BS98033	Liver	2.07	68.8	-	0.001	-	0.001	-	-	0.001	-	0.00008	0.001	0.001	0.0004
BS98034	Kidney	9.41	66	0.00003	-	0.001	-	0.001	0.00004	0.0022	0.00020	0.00003	0.001	-	-
BS98034	Liver	1.35	71.2	0.00003	-	0.00016	-	0.0004	0.00003	0.0005	0.00003	0.00003	0.0001	-	-
BS98036	Kidney	0.357	80.6	0.00005	-	0.0016	-	0.0011	0.0002	0.0072	0.001	0.00005	0.0025	-	-
BS98036	Liver	0.943	75.6	0.00004	-	0.007	-	0.0023	0.0007	0.0311	0.0019	0.00005	0.0094	-	-
KL96003	Kidney	2.12	74.6	-	0.0032	-	0.0018	-	-	0.0031	-	<0.00008	0.001	0.0003	0.0002

Appendix F1. Continued

Animal ID	MATRIX	% Lipid	% Moisture	PCB # 10	PCB # 101	PCB # 105	PCB # 105/141	PCB # 110	PCB # 114	PCB # 118	PCB # 123	PCB # 126	PCB # 128	PCB # 132	PCB # 137
KL96003	Liver	1.32	71.7	-	0.001	-	<0.00007	-	-	0.0046	-	<0.00007	0.0004	0.0002	0.0001
PW96219	Kidney	3.07	77.7	0.00004	-	0.0017	-	0.0016	0.0002	0.009	0.001	0.00006	0.0031	-	-
PW96219	Liver	0.924	69.6	0.00003	-	0.00029	-	0.0004	0.00004	0.0013	0.00009	0.00003	0.00040	-	-
RU98001	Kidney	3.86	72.7	-	0.0037	-	0.004	-	-	0.0062	-	<0.00007	0.0019	0.0001	0.0017
RU98001	Liver	2.04	72.1	-	0.0016	-	0.0017	-	-	0.0017	-	<0.00007	0.0004	0.0001	0.0003
RU98002	Kidney	0.888	73.3	-	0.0064	-	0.0075	-	-	0.0127	-	0.00033	0.0029	0.0012	0.0018
RU98002	Liver	1.31	71.2	-	0.0038	-	0.0042	-	-	0.0052	-	0.0001	0.0013	0.0003	0.001
YA96030	Kidney	6.55	70	-	0.007	-	0.0073	-	-	0.009	-	0.0001	0.0021	0.0012	0.0016
YA96030	Liver	1.26	69.9	-	0.0011	-	0.0013	-	-	0.0016	-	0.0001	0.001	0.001	0.0015

Appendix F2. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in ppm dw.

Animal ID	MATRIX	PCB# 138	PCB# 146	PCB# 149	PCB# 151	PCB# 153	PCB# 157	PCB # 158	PCB # 16	PCB # 163	PCB # 166	PCB # 167	PCB # 169	PCB # 17	PCB # 170	PCB # 174
140007	Kidney	0.001	-	-	-	0.001	0.001	0.0124	-	0.0003	0.0001	0.002	0.00012	0.0001	0.00004	-
140007	Liver	0.0035	-	-	-	0.0032	0.0000	0.0005	0.0001		0.0000	0.0001	0.00005	0.0001	0.00006	-
195003	Kidney	0.0064	0.0014	0.001	0.0001	0.0094	0.0002	0.001	-	0.0013	-	0.0002	<0.00004	-	0.0012	0.00009
195003	Liver	0.0014	0.001	0.0004	0.0000	0.0014	0.0001	0.0001	-	0.0000	-	0.0004	<0.00003	-	0.0002	<0.00003
230001	Kidney	0.0031	0.001	0.001	0.0001	0.0048	0.0002	0.0002	-	0.001	-	0.0002	<0.00004	-	0.0003	0.00007
230001	Liver	0.001	0.001	0.0004	0.0002	0.0016	0.0002	0.0000	-	0.0002	-	<0.00004	<0.00004	-	0.0001	0.00004
480002	Kidney	<0.001	-	-	<0.001	<0.001	-	<0.001	-	-	-	<0.001	<0.001	-	<0.001	<0.001
480002	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
480014	Kidney	<0.001	-	-	<0.001	0.0068	-	<0.001	-	-	-	<0.001	<0.001	-	<0.001	<0.001
480014	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
480015	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
480015	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500001	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500001	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500003	Kidney	0.0038	-	-	<0.002	0.0054	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500003	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500004	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500004	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500006	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500006	Liver	<0.002	-	-	<0.002	0.0048	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500007	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500007	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500008	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500008	Liver	0.0018	-	-	<0.002	0.0036	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500009	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500009	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500010	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
500010	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
570004	Kidney	<0.0009	-	-	<0.0009	<0.0009	-	<0.0009	-	-	-	<0.0009	<0.0009	-	<0.0009	<0.0009
570004	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002

Appendix F2. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in ppm dw.

Animal ID	MATRIX	PCB# 138	PCB# 146	PCB# 149	PCB# 151	PCB# 153	PCB# 157	PCB # 158	PCB # 16	PCB # 163	PCB # 166	PCB # 167	PCB # 169	PCB # 17	PCB # 170	PCB # 174
570007	Kidney	<0.001	-	-	<0.001	<0.001	-	<0.001	-	-	-	<0.001	<0.001	-	<0.001	<0.001
570007	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
600001	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
600001	Liver	<0.002	-	-	<0.002	0.0027	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
600015	Kidney	0.0066	-	-	0.0017	0.0107	-	<0.002	-	-	-	<0.002	<0.002	-	0.0019	0.0018
600015	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
650002	Kidney	0.0234	-	-	-	0.0366	0.00029	0.0014	0.0001	-	0.00004	0.001	0.00004	<0.00004	0.001	-
650002	Liver	0.0031	-	-	-	0.0036	0.00003	0.0002	0.0001	-	0.00003	0.00007	0.00003	0.00003	0.0002	-
BS94001	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94004	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94006	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94009	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94010	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94011	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94012	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94016	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
BS94016	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
BS94017	Kidney	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
BS94017	Liver	<0.002	-	-	<0.002	<0.002	-	<0.002	-	-	-	<0.002	<0.002	-	<0.002	<0.002
BS94018	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94018	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS96009	Kidney	0.0293	-	-	-	0.0414	0.0005	0.0023	0.0001	-	0.0001	0.001	0.0001	0.0001	0.0014	-

Appendix F2. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in ppm dw.

Animal ID	MATRIX	PCB# 138	PCB# 146	PCB# 149	PCB# 151	PCB# 153	PCB# 157	PCB # 158	PCB # 16	PCB # 163	PCB # 166	PCB # 167	PCB # 169	PCB # 17	PCB # 170	PCB # 174
BS96009	Liver	0.107	-	-	-	0.144	0.0018	0.0093	0.0002	-	0.0003	0.0031	0.0003	0.0001	0.0042	-
BS96011	Kidney	<0.001	-	-	<0.001	<0.001	-	<0.001	-	-	<0.001	<0.001	-	<0.001	<0.001	
BS96011	Liver	<0.002	-		<0.002	<0.002		<0.002			<0.002	<0.002		<0.002	<0.002	
BS96012	Kidney	<0.002	-		<0.002	<0.002		<0.002			<0.002	<0.002		<0.002	<0.002	
BS96012	Liver	<0.002	-		<0.002	<0.002		<0.002			<0.002	<0.002		<0.002	<0.002	
BS96013	Kidney	<0.002	-		<0.002	<0.002		<0.002			<0.002	<0.002		<0.002	<0.002	
BS96013	Liver	<0.002			<0.002	<0.002		<0.002			<0.002	<0.002		<0.002	<0.002	
BS96023	Kidney	<0.002			<0.002	<0.002		<0.002			<0.002	<0.002		<0.002	<0.002	
BS96023	Liver	0.01			0.0028	0.01		0.0197			<0.002	<0.002		<0.002	0.0018	
BS96023A	Liver	0.0018	0.001	0.0026	0.001	0.0015	0.00010	0.0002		0.001		0.0002	<0.00003		0.0002	0.0004
BS96023A	Kidney	0.0035	0.001	0.0027	0.0012	0.0038	0.00020	0.0002		0.001		0.0005	<0.00004		0.0005	0.001
BS97011	Kidney	0.0054	0.0014	0.0019	0.001	0.01	0.0003	0.001		0.002		0.0003	<0.00004		0.0014	0.0003
BS97011	Liver	0.001	0.001	0.001	0.0002	0.0014	0.0001	0.0001		0.0014		0.0001	<0.00003		0.0002	0.0001
BS97012	Kidney	0.012				0.0113	0.0001	0.001	0.0003		0.00003	0.0004	0.00007	0.00007	0.00004	
BS97012	Liver	0.0011				0.001	0.00003	0.00003	0.0002		0.00003	0.00003	0.00004	0.00005	0.00003	
BS97018	Kidney	0.0192				0.0185	0.0002	0.0014	0.001		0.00006	0.001	0.00003	0.00008	0.0002	
BS97018	Liver	0.0014				0.0012	0.00004	0.0001	0.0001		0.00004	0.0001	0.00004	0.00005	0.00004	
BS97023	Kidney	<0.0001	0.001	<0.00004	<0.00004	0.0013	0.0006	0.0023		<0.00004		<0.00004	<0.00004		0.0002	<0.00004
BS97023	Liver	0.0021	0.001	0.00031	0.00004	0.0022	0.0001	0.0004		0.001		0.0001	<0.00003		0.0002	<0.00003
BS97030	Kidney	0.0075	0.0016	0.0029	0.0013	0.0161	0.0003	0.0011		0.0027		0.0003	<0.00005		0.0022	0.0003
BS97030	Liver	0.0338	0.0061	0.0075	0.0029	0.0789	0.0004	0.0026		0.0092		0.0011	<0.00004		0.0075	0.0011
BS97036	Kidney	0.001				0.001	0.00004	0.0001	0.00004		0.00004	0.00004	0.00004	<0.00004	0.00004	
BS97036	Liver	0.001				0.001	0.00003	0.0001	0.0001		0.00003	0.00003	0.00003	0.00003	0.00003	
BS97044	Kidney	0.016				0.0242	0.0002	0.001	0.0001		0.00004	0.0003	0.00004	0.00006	0.0019	
BS97044	Liver	0.0027				0.0026	0.00004	0.0002	0.0001		0.00004	0.00007	0.00004	0.00004	0.00004	
BS97048	Kidney	0.0191				0.029	0.00025	0.0014	0.0001		0.00004	0.001	0.00003	0.00003	0.0023	
BS97048	Liver	0.0038				0.0032	0.00003	0.0002	0.0001		0.00003	0.0001	0.00003	0.00003	0.0004	
BS97057	Kidney	0.002				0.0019	0.00018	0.0017	0.0005		0.00004	0.0004	0.00009	0.00045	0.00004	
BS97057	Liver	0.001				0.001	0.00007	0.001	0.0002		0.00003	0.0001	0.00003	0.00004	0.00003	

Appendix F2. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in ppm dw.

Animal ID	MATRIX	PCB# 138	PCB# 146	PCB# 149	PCB# 151	PCB# 153	PCB# 157	PCB # 158	PCB # 16	PCB # 163	PCB # 166	PCB # 167	PCB # 169	PCB # 17	PCB # 170	PCB # 174
BS98001	Kidney	0.0034				0.0046	0.00005	0.0003	0.00005		0.00005	0.0001	0.00006	0.00005	0.00005	
BS98001	Liver	0.0045				0.006	0.00005	0.0004	0.0002		0.00004	0.0001	0.00004	0.00004	0.0002	
BS98006	Kidney	0.0093				0.0126	0.00010	0.001	0.0001		0.00004	0.0002	0.00007	0.00004	0.0004	
BS98006	Liver	0.0028	-	-	-	0.003	0.00004	0.0002	0.0001	-	0.00004	0.0001	0.00004	0.00004	0.00004	-
BS98014	Kidney	0.0092	0.0046	0.0035	0.0017	0.0181	0.00032	0.0005	-	0.001	-	0.0014	<0.00004	-	0.001	0.001
BS98014	Liver	0.0037	0.0029	0.0024	0.001	0.0004	0.00012	0.0003	-	0.0015	-	0.001	<0.00003	-	0.0003	0.0003
BS98016	Kidney	0.0196	-	-	-	0.0295	0.0002	0.0013	0.0002	-	0.00004	0.001	0.00004	0.00004	0.0031	-
BS98016	Liver	0.0066	-	-	-	0.007	0.0001	0.001	0.0001	-	0.00004	0.0002	0.00004	0.00005	0.00044	-
BS98019	Kidney	0.0025	-0.00004	<0.00004	<0.00004	0.002	0.0002	0.0003	-	0.0000	-	0.001	<0.00004	-	0.00022	0.00018
BS98019	Liver	0.001	0.0001	0.0011	0.0001	0.001	0.0001	0.0001	-	0.0000	-	<0.00003	<0.00003	-	0.00005	0.00005
BS98022	Kidney	0.0017	0.001	0.001	0.0004	0.0018	0.0001	0.0002	-	0.0005	-	0.0002	<0.00004	-	0.00018	0.00005
BS98022	Liver	0.001	0.0003	0.0005	0.0001	0.001	0.0001	0.0001	-	0.0005	-	0.0002	<0.00004	-	<0.00004	<0.00004
BS98026	Kidney	0.0065	0.0023	0.0228	0.0013	0.0121	0.0002	0.001	-	0.0028	-	0.001	0.00431	-	0.0011	0.00028
BS98026	Liver	0.0033	0.0012	0.0021	0.001	0.007	0.0001	0.0004	-	0.0019	-	0.0003	<0.00003	-	0.001	0.00015
BS98028	Kidney	0.0002	-	-	-	0.0001	0.0002	0.0019	0.0002	-	0.00005	0.0004	0.00005	0.00010	0.00005	-
BS98028	Liver	0.001	-	-	-	0.0005	0.0000	0.0001	0.0002	-	0.00004	0.0000	0.00004	0.00004	0.00004	-
BS98029	Kidney	0.0082	0.0036	0.0039	<0.00005	0.0184	0.0005	0.001	-	0.003	-	0.0013	<0.00005	-	0.0021	0.001
BS98029	Liver	0.0122	0.0046	0.0042	0.003	0.0269	0.001	0.0014	-	0.0063	-	<0.00004	<0.00004	-	0.0024	0.0003
BS98030	Kidney	0.0016	0.0004	0.001	<0.00004	0.002	0.0001	0.0001	-	0.0002	-	0.0002	<0.00004	-	0.0004	0.0001
BS98030	Liver	0.001	0.0011	0.001	0.00015	0.0013	0.0001	0.0001	-	<0.00003	-	0.0001	<0.00003	-	0.0001	0.0001
BS98031	Kidney	0.0382	0.0077	0.0294	0.0109	0.0647	0.001	0.0035	-	0.0097	-	0.0017	<0.00003	-	0.0038	0.0035
BS98031	Liver	0.0036	0.001	0.0055	0.0011	0.0052	0.0002	0.001	-	0.002	-	0.0003	<0.00003	-	0.001	0.001
BS98032	Kidney	0.0035	0.001	0.0015	0.0011	0.0051	0.0002	0.0005	-	0.0011	-	0.0027	<0.00005	-	0.0004	0.0002
BS98032	Liver	0.104	0.0398	0.0478	0.0267	0.175	0.0015	0.0068	-	0.0279	-	0.01	<0.00004	-	0.0084	0.0025
BS98033	Kidney	<0.00008	0.0005	0.0003	0.0001	0.0015	0.0001	0.0001	-	0.0013	-	<0.00004	<0.00004	-	0.0003	0.0003
BS98033	Liver	0.0014	0.0004	0.001	0.0002	0.0014	0.0001	0.0002	-	<0.00003	-	0.0017	<0.00003	-	0.0001	0.0003
BS98034	Kidney	0.0047	-	-	-	0.0074	0.0001	0.0003	0.0001	-	0.00003	0.0001	0.00004	0.00003	0.00003	-
BS98034	Liver	0.001	-	-	-	0.001	0.0000	0.0001	0.0001	-	0.00003	0.0000	0.00003	0.00004	0.00003	-
BS98036	Kidney	0.0129	-	-	-	0.0139	0.0002	0.0012	0.0017	-	0.00006	0.0004	0.00006	0.00026	0.001	-
BS98036	Liver	0.0451	-	-	-	0.0451	0.001	0.004	0.0000	-	0.0002	0.0012	0.00004	0.00004	0.0017	-

Appendix F2. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in ppm dw.

Animal ID	MATRIX	PCB# 138	PCB# 146	PCB# 149	PCB# 151	PCB# 153	PCB# 157	PCB # 158	PCB # 16	PCB # 163	PCB # 166	PCB # 167	PCB # 169	PCB # 17	PCB # 170	PCB # 174
KL96003	Kidney	0.0055	0.0015	0.0011	0.001	0.0122	0.0002	0.0004	-	0.0015	-	0.0003	<0.00004	-	0.001	0.0001
KL96003	Liver	0.0017	0.0005	0.0057	0.0004	0.0039	0.0000	0.0002	-	0.001	-	0.0001	<0.00004	-	0.0002	<0.00004
PW96219	Kidney	0.0161	-	-	-	0.0148	0.0002	0.0012	0.0001	-	0.00004	0.0003	0.00006	0.00008	0.001	-
PW96219	Liver	0.0023	-	-	-	0.0018	0.0000	0.0002	0.0001	-	0.00003	0.0001	0.00003	0.00003	0.00003	-
RU98001	Kidney	0.007	0.0014	0.0016	0.0005	0.0099	0.0002	0.001	-	0.0015	-	0.001	<0.00004	-	0.001	0.0003
RU98001	Liver	0.002	0.001	0.0025	0.0004	0.0036	0.0002	0.0001	-	0.001	-	0.0003	<0.00004	-	0.0002	0.0001
RU98002	Kidney	0.0116	0.0035	0.0045	0.001	0.0195	0.0004	0.0008	-	0.0019	-	0.001	<0.00004	-	0.001	0.0003
RU98002	Liver	0.0049	0.0013	0.003	0.001	0.0066	0.0003	0.0003	-	0.0014	-	0.0003	<0.00003	-	0.0004	0.0001
YA96030	Kidney	0.0107	0.0037	0.005	0.0047	0.0197	0.0003	0.0015	-	0.0025	-	0.001	<0.00003	-	0.001	0.001
YA96030	Liver	0.0032	0.0005	0.0017	0.001	0.003	0.0001	0.0005	-	0.0018	-	0.0002	<0.00003	-	0.0003	0.0002

Appendix F3. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in mg/kg (ppm) dry weight basis.

Animal ID	MATRIX	PCB # 18	PCB # 180	PCB # 182	PCB # 183	PCB # 187	PCB # 189	PCB # 190	PCB # 194	PCB # 195	PCB# 20/3	PCB # 206	PCB # 209	PCB # 22	PCB # 25
140007	Kidney	-	-	-	-	-	0.0001	-	-	-	0.0013	-	-	0.0002	0.0001
140007	Liver	-	-	-	-	-	0.0001	-	-	-	0.0005	-	-	0.0001	0.00004
195003	Kidney	<0.0001	0.0035	<0.00004	0.0003	0.001	0.0001	0.0003	0.0022	0.0002	-	0.001	0.001	-	-
195003	Liver	<0.0001	0.0004	0.00004	0.0001	0.0023	0.0001	0.0000	0.001	0.00007	-	0.0003	<0.00003	-	-
230001	Kidney	<0.0001	0.001	<0.00004	0.001	0.001	<0.00004	0.0002	0.0025	0.0001	-	0.0027	<0.00004	-	-
230001	Liver	<0.0001	0.0002	<0.00004	0.0001	0.0005	0.0001	0.0000	0.0003	<0.00004	-	0.0003	<0.00004	-	-
480002	Kidney	<0.001	<0.001	-	-	-	<0.001	-	<0.001	-	-	-	-	-	-
480002	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
480014	Kidney	<0.001	0.002	-	-	-	<0.001	-	<0.001	-	-	-	-	-	-
480014	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
480015	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
480015	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500001	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500001	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500003	Kidney	<0.002	<0.002	-	-	-	<0.002	-	0.0022	-	-	-	-	-	-
500003	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500004	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500004	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500006	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500006	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500007	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500007	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500008	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500008	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500009	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500009	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500010	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
500010	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
570004	Kidney	<0.0009	<0.0009	-	-	-	<0.0009	-	<0.0009	-	-	-	-	-	-

Appendix F3. Continued

Animal ID	MATRIX	PCB # 18	PCB # 180	PCB # 182	PCB # 183	PCB # 187	PCB # 189	PCB # 190	PCB # 194	PCB # 195	PCB# 20/3	PCB # 206	PCB # 209	PCB # 22	PCB # 25
570004	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
570007	Kidney	<0.001	<0.001	-	-	-	<0.001	-	<0.001	-	-	-	-	-	-
570007	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
600001	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
600001	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
600015	Kidney	<0.002	0.0055	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
600015	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
650002	Kidney	-	-	-	-	-	0.0001	-	-	-	<0.00004	-	-	0.00005	<0.00004
650002	Liver	-	-	-	-	-	0.0001	-	-	-	0.001	-	-	0.00005	0.00003
BS94001	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94004	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94006	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94009	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94010	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94011	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94012	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94016	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
BS94016	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
BS94017	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
BS94017	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-
BS94018	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94018	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix F3. Continued

Animal ID	MATRIX	PCB # 18	PCB # 180	PCB # 182	PCB # 183	PCB # 187	PCB # 189	PCB # 190	PCB # 194	PCB # 195	PCB# 20/3	PCB # 206	PCB # 209	PCB # 22	PCB # 25	
BS96009	Kidney	-	-	-	-	-	0.0002	-	-	-	<0.0001	-	-	0.00018	<0.00005	
BS96009	Liver	-	-	-	-	-	0.0005	-	-	-	0.001	-	-	0.00011	0.00005	
BS96011	Kidney	<0.001	<0.001	-	-	-	<0.001	-	<0.001	-	-	-	-	-	-	
BS96011	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-	
BS96012	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-	
BS96012	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-	
BS96013	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-	
BS96013	Liver	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-	
BS96023	Kidney	<0.002	<0.002	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-	
BS96023	Liver	<0.002	0.0032	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-	
BS96023	A	Liver	<0.0001	0.001	<0.00003	0.0015	0.0037	0.00007	<0.00003	0.001	<0.00003	-	0.0002	<0.00003	-	-
BS96023	A	Kidney	<0.0001	0.0014	0.00007	0.0004	0.001	0.00007	0.0002	0.002	0.0002	-	0.0022	<0.00004	-	-
BS97011	Kidney	<0.0001	0.0039	<0.00004	0.0011	0.0021	0.00026	0.001	0.0035	0.0005	-	0.005	0.001	-	-	
BS97011	Liver	<0.0001	0.001	<0.00003	0.0002	0.0035	<0.00003	0.0001	0.0003	0.0001	-	0.0003	<0.00003	-	-	
BS97012	Kidney	-	-	-	-	-	0.00007	-	-	-	0.0012	-	-	-	-	
BS97012	Liver	-	-	-	-	-	0.00006	-	-	-	0.00003	-	-	0.00006	0.00003	
BS97018	Kidney	-	-	-	-	-	0.00006	-	-	-	<0.00003	-	-	<0.00003	0.00005	
BS97018	Liver	-	-	-	-	-	0.00007	-	-	-	0.00004	-	-	0.00006	0.00004	
BS97023	Kidney	<0.0001	0.001	<0.00004	<0.00004	<0.00004	<0.00004	0.0003	0.0045	<0.00004	-	<0.00004	<0.00004	-	-	
BS97023	Liver	<0.0001	0.001	<0.00003	0.0002	0.0005	0.00005	0.0001	0.001	0.00004	-	0.00044	<0.00003	-	-	
BS97030	Kidney	<0.0001	0.0054	<0.00005	0.0023	0.0034	0.00045	0.001	0.0045	0.0013	-	0.0015	0.002	-	-	
BS97030	Liver	<0.0001	0.0281	0.001	0.0092	0.0167	0.00034	0.0013	0.0043	0.0018	-	0.0057	0.0029	-	-	
BS97036	Kidney	-	-	-	-	-	<0.00004	-	-	-	0.00043	-	-	0.00004	<0.00004	
BS97036	Liver	-	-	-	-	-	0.00006	-	-	-	0.00003	-	-	0.00005	0.00003	
BS97044	Kidney	-	-	-	-	-	0.00007	-	-	-	<0.00004	-	-	0.00007	<0.00004	
BS97044	Liver	-	-	-	-	-	0.00007	-	-	-	0.00004	-	-	0.00005	0.00004	
BS97048	Kidney	-	-	-	-	-	0.00021	-	-	-	0.00003	-	-	0.0001	0.00004	
BS97048	Liver	-	-	-	-	-	0.00006	-	-	-	0.00003	-	-	0.00010	0.00003	
BS97057	Kidney	-	-	-	-	-	0.00011	-	-	-	0.0032	-	-	0.00070	0.0002	

Appendix F3. Continued

Animal ID	MATRIX	PCB # 18	PCB # 180	PCB # 182	PCB # 183	PCB # 187	PCB # 189	PCB # 190	PCB # 194	PCB # 195	PCB# 20/3	PCB # 206	PCB # 209	PCB # 22	PCB # 25
BS97057	Liver	-	-	-	-	-	0.00007	-	-	-	0.00003	-	-	0.00009	0.00003
BS98001	Kidney	-	-	-	-	-	0.00009	-	-	-	0.00005	-	-	0.00001	0.00005
BS98001	Liver	-	-	-	-	-	0.00004	-	-	-	0.00045	-	-	0.00005	0.00004
BS98006	Kidney	-	-	-	-	-	0.00008	-	-	-	0.00004	-	-	0.00005	0.00004
BS98006	Liver	-	-	-	-	-	0.00007	-	-	-	0.00004	-	-	0.00005	0.00004
BS98014	Kidney	<0.0001	0.003	<0.00004	0.001	0.0019	0.00019	0.0003	0.0024	0.0004	-	0.005	0.001	-	-
BS98014	Liver	<0.0001	0.001	<0.00003	0.0003	0.0057	<0.00003	0.0001	0.0004	<0.00003	-	<0.00003	0.0002	-	-
BS98016	Kidney	-	-	-	-	-	0.0002	-	-	-	0.001	-	-	0.00004	0.00004
BS98016	Liver	-	-	-	-	-	0.00004	-	-	-	0.001	-	-	0.00007	0.00004
BS98019	Kidney	<0.0001	0.0005	<0.00004	0.001	0.0000	0.0003	<0.00004	0.0018	<0.00004	-	0.0012	<0.00004	-	-
BS98019	Liver	<0.0001	0.0001	<0.00003	0.0001	0.0002	<0.00003	<0.00003	<0.00003	<0.00003	-	0.0003	<0.00003	-	-
BS98022	Kidney	<0.0001	0.001	<0.00004	0.0002	0.0004	0.00020	<0.00004	0.001	<0.00004	-	0.001	0.0011	-	-
BS98022	Liver	<0.0001	0.0001	<0.00004	<0.00004	0.001	0.00004	0.0001	<0.00004	<0.00004	-	<0.00004	<0.00004	-	-
BS98026	Kidney	<0.0001	0.0042	0.00032	0.0025	0.0047	0.0003	0.0001	0.0043	0.001	-	0.0108	0.001	-	-
BS98026	Liver	<0.0001	0.002	<0.00003	0.0011	0.0043	0.0001	0.0001	0.0017	0.0001	-	<0.00003	<0.00003	-	-
BS98028	Kidney	-	-	-	-	-	0.0001	-	-	-	0.00005	-	-	0.0002	0.00005
BS98028	Liver	-	-	-	-	-	0.0001	-	-	-	0.00004	-	-	0.00005	0.00004
BS98029	Kidney	<0.0001	0.0046	<0.00005	0.0016	0.0029	0.0003	0.001	0.0048	0.001	-	0.0068	<0.00005	-	-
BS98029	Liver	<0.0001	0.0059	0.00041	0.0014	0.005	<0.00004	0.0004	0.0039	0.0003	-	<0.00004	<0.00004	-	-
BS98030	Kidney	<0.0001	0.001	<0.00004	0.0002	0.0004	<0.00004	0.0001	0.0018	<0.00004	-	0.0016	0.00023	-	-
BS98030	Liver	<0.0001	0.0003	<0.00003	0.0001	0.001	<0.00003	<0.00003	<0.00003	0.00004	-	<0.00003	<0.00003	-	-
BS98031	Kidney	<0.0001	0.0191	<0.00003	0.0059	0.0168	0.0003	0.0014	0.0032	0.00004	-	0.0271	0.0014	-	-
BS98031	Liver	<0.0001	0.0016	0.00059	0.001	0.0021	0.0001	0.0002	<0.00003	<0.00003	-	<0.00003	0.001	-	-
BS98032	Kidney	<0.0001	0.0001	<0.00005	0.0005	0.0011	0.0001	0.0002	0.0013	<0.00005	-	<0.00005	<0.00005	-	-
BS98032	Liver	<0.0001	0.0398	0.00378	0.0155	0.0331	0.0006	0.0022	0.0044	0.0048	-	0.0398	0.001	-	-
BS98033	Kidney	<0.0001	0.001	<0.00004	0.001	0.001	0.0001	0.0001	0.0013	<0.00004	-	0.00049	<0.00004	-	-
BS98033	Liver	<0.0001	0.0032	<0.00003	0.0001	0.0004	0.0002	<0.00003	0.0004	<0.00003	-	<0.00003	<0.00003	-	-
BS98034	Kidney	-	-	-	-	-	0.0001	-	-	-	0.001	-	-	0.00004	0.00003
BS98034	Liver	-	-	-	-	-	0.00003	-	-	-	0.001	-	-	0.00003	0.00003

Appendix F3. Continued

Animal ID	MATRIX	PCB # 18	PCB # 180	PCB # 182	PCB # 183	PCB # 187	PCB # 189	PCB # 190	PCB # 194	PCB # 195	PCB# 20/3	PCB # 206	PCB # 209	PCB # 22	PCB # 25
BS98036	Kidney	-	-	-	-	-	0.0001	-	-	-	0.001	-	-	0.0002	0.00005
BS98036	Liver	-	-	-	-	-	0.0001	-	-	-	0.00004	-	-	0.0001	0.00004
KL96003	Kidney	<0.0001	0.0026	<0.00004	0.001	0.0017	0.0001	0.0002	0.001	0.0001	-	0.001	<0.00004	-	-
KL96003	Liver	<0.0001	0.001	<0.00004	0.0004	0.001	<0.00004	0.0001	0.0005	<0.00004	-	<0.00004	<0.00004	-	-
PW96219	Kidney	-	-	-	-	-	0.00004	-	-	-	0.0011	-	-	0.00009	0.00004
PW96219	Liver	-	-	-	-	-	0.0001	-	-	-	0.001	-	-	0.00007	0.00003
RU98001	Kidney	<0.0001	0.0017	<0.00004	0.001	0.0018	0.0001	0.0001	0.001	0.0001	-	0.0005	0.00040	-	-
RU98001	Liver	<0.0001	0.0005	<0.00004	0.0001	0.001	<0.00004	0.00004	0.0003	<0.00004	-	<0.00004	<0.00004	-	-
RU98002	Kidney	<0.0001	0.0021	<0.00004	0.0004	0.0015	0.0001	0.0002	0.0014	0.00016	-	0.00045	<0.00004	-	-
RU98002	Liver	<0.0001	0.001	<0.00003	0.0002	0.0017	<0.00003	0.0001	0.0004	<0.00003	-	<0.00003	<0.00003	-	-
YA96030	Kidney	<0.0001	0.0024	<0.00003	0.0010	0.0025	0.0001	0.0004	0.0012	<0.00003	-	<0.00003	<0.00003	-	-
YA96030	Liver	<0.0001	0.001	<0.00003	0.0002	0.001	<0.00003	0.00004	0.0004	<0.00003	-	<0.00003	0.00007	-	-

Appendix F4. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in mg/kg (ppm) dry weight basis.

Animal ID	MATRIX	PCB # 28	PCB # 29	PCB # 30	PCB # 31	PCB # 32	PCB # 33	PCB # 39	PCB # 41	PCB # 44	PCB # 47	PCB # 48	PCB # 48/4	PCB # 49	PCB # 52
140007	Kidney	0.001	0.00000	0.00000	0.001	-	-	<0.00004	<0.00004	-	-	-	0.001	-	0.0016
140007	Liver	0.0002	0.00004	0.00004	0.0002	-	-	0.00004	0.00004	-	-	-	0.0002	-	0.0005
195003	Kidney	-	-	-	0.0021	<0.00009	<0.00009	-	-	0.0011	0.001	<0.0001	-	0.004	-
195003	Liver	-	-	-	0.0044	<0.00007	<0.00007	-	-	0.0014	0.001	<0.0001	-	<0.0001	-
230001	Kidney	-	-	-	0.0019	<0.00007	<0.00007	-	-	0.001	0.0003	0.001	-	0.0031	-
230001	Liver	-	-	-	0.0014	<0.00007	<0.00007	-	-	<0.00007	0.0004	<0.0001	-	0.0032	-
480002	Kidney	-	-	-	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-	<0.001	<0.001
480002	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
480014	Kidney	-	-	-	<0.001	<0.001	0.0047	-	-	<0.001	-	-	-	<0.001	<0.001
480014	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
480015	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
480015	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500001	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500001	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500003	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500003	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500004	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500004	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500006	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500006	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500007	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500007	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500008	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500008	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500009	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500009	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500010	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
500010	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002

Appendix F4. Continued

Animal ID	MATRIX	PCB # 28	PCB # 29	PCB # 30	PCB # 31	PCB # 32	PCB # 33	PCB # 39	PCB # 41	PCB # 44	PCB # 47	PCB # 48	PCB # 48/4	PCB # 49	PCB # 52
570004	Kidney	-	-	-	<0.0009	<0.0009	<0.0009	-	-	<0.0009	-	-	-	<0.0009	<0.0009
570004	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
570007	Kidney	-	-	-	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-	<0.001	<0.001
570007	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
600001	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
600001	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
600015	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
600015	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
650002	Kidney	0.0001	<0.00004	<0.00004	0.0001	-	-	<0.00004	<0.00004	-	-	-	0.0002	-	0.001
650002	Liver	0.0002	0.00003	0.00003	0.0002	-	-	0.00003	0.00003	-	-	-	0.0002	-	0.0004
BS94001	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94004	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94006	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94009	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94010	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94011	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94012	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94016	Kidney	-	-	-	<0.002	-	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
BS94016	Liver	-	-	-	<0.002	-	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
BS94017	Kidney	-	-	-	<0.002	-	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
BS94017	Liver	-	-	-	<0.002	-	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002
BS94018	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94018	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix F4. Continued

Animal ID	MATRIX	PCB # 28	PCB # 29	PCB # 30	PCB # 31	PCB # 32	PCB # 33	PCB # 39	PCB # 41	PCB # 44	PCB # 47	PCB # 48	PCB # 48/4	PCB # 49	PCB # 52	
BS94022	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BS94022	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BS96009	Kidney	0.0003	<0.0001	0.0001	0.0003	-	-	0.0001	<0.0001	-	-	-	0.0002	-	0.001	
BS96009	Liver	0.0002	0.0000	0.0000	0.0002	-	-	0.00005	0.0000	-	-	-	0.0003	-	0.0015	
BS96011	Kidney	-	-	-	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-	<0.001	<0.001	
BS96011	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002	
BS96012	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002	
BS96012	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002	
BS96013	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002	
BS96013	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002	
BS96023	Kidney	-	-	-	<0.002	<0.002	<0.002	-	-	<0.002	-	-	-	<0.002	<0.002	
BS96023	Liver	-	-	-	<0.002	<0.002	<0.002	-	-	0.0038	-	-	-	<0.002	<0.002	
BS96023	A	-	-	-	0.0014	<0.00007	<0.00007	-	-	0.001	0.0003	<0.0001	-	<0.0001	-	
BS96023	A	Kidney	-	-	-	0.0024	<0.00008	<0.00008	-	-	0.001	0.0003	0.001	-	0.0029	-
BS97011	Kidney	-	-	-	0.0021	<0.00008	<0.00008	-	-	0.0012	0.0003	0.0005	-	0.0043	-	
BS97011	Liver	-	-	-	0.0023	<0.00006	<0.00006	-	-	0.0005	0.0005	<0.0001	-	<0.0001	-	
BS97012	Kidney	0.001	<0.00003	<0.00003	0.0003	-	-	<0.00003	<0.00003	-	-	-	0.0002	-	0.001	
BS97012	Liver	0.0002	0.00003	0.00003	0.0002	-	-	0.00003	0.00003	-	-	-	0.0002	-	0.0004	
BS97018	Kidney	0.001	0.00006	<0.00003	0.0002	-	-	<0.00003	<0.00003	-	-	-	0.0002	-	0.001	
BS97018	Liver	0.0002	0.00004	0.00004	0.0002	-	-	0.00004	0.00004	-	-	-	0.0002	-	0.0005	
BS97023	Kidney	-	-	-	0.001	<0.00008	<0.00008	-	-	<0.0001	<0.0001	<0.0001	-	0.0025	-	
BS97023	Liver	-	-	-	0.001	<0.00006	<0.00006	-	-	0.0003	0.001	<0.0001	-	<0.0001	-	
BS97030	Kidney	-	-	-	0.001	<0.00011	<0.00011	-	-	<0.0001	<0.0001	0.001	-	0.0037	-	
BS97030	Liver	-	-	-	0.0017	<0.00009	<0.00009	-	-	0.001	0.001	<0.0001	-	<0.0001	-	
BS97036	Kidney	0.0003	<0.00004	<0.00004	0.0001	-	-	<0.00004	<0.00004	-	-	-	0.0001	-	0.0004	
BS97036	Liver	0.0001	0.00003	0.00003	0.0001	-	-	0.00003	0.00003	-	-	-	0.0002	-	0.0003	
BS97044	Kidney	0.0002	<0.00004	<0.00004	0.0002	-	-	<0.00004	<0.00004	-	-	-	0.0004	-	0.0019	
BS97044	Liver	0.0002	0.00004	0.00004	0.0001	-	-	0.00004	0.00004	-	-	-	0.0002	-	0.001	

Appendix F4. Continued

Animal ID	MATRIX	PCB # 28	PCB # 29	PCB # 30	PCB # 31	PCB # 32	PCB # 33	PCB # 39	PCB # 41	PCB # 44	PCB # 47	PCB # 48	PCB # 48/4	PCB # 49	PCB # 52
BS97048	Kidney	0.0004	0.00003	0.00003	0.0003	-	-	0.00003	0.00003	-	-	-	0.001	-	0.0029
BS97048	Liver	0.0003	0.00003	0.00004	0.0002	-	-	0.00003	0.00003	-	-	-	0.0002	-	0.001
BS97057	Kidney	0.0014	0.00004	0.00004	0.0013	-	-	0.00005	0.00004	-	-	-	0.001	-	0.0011
BS97057	Liver	0.0003	0.00003	0.00003	0.0003	-	-	0.00003	0.00003	-	-	-	0.0004	-	0.001
BS98001	Kidney	0.0002	0.00005	0.00005	0.0002	-	-	0.00005	0.00005	-	-	-	0.0002	-	0.0004
BS98001	Liver	0.0002	0.00004	0.00004	0.0001	-	-	0.00004	0.00004	-	-	-	0.0002	-	0.0004
BS98006	Kidney	0.001	0.00004	0.00004	0.0001	-	-	0.00004	0.00004	-	-	-	0.0004	-	0.0019
BS98006	Liver	0.0003	0.00004	0.00004	0.0002	-	-	0.00004	0.00004	-	-	-	0.0003	-	0.001
BS98014	Kidney	-	-	-	0.0033	<0.0001	<0.0001	-	-	0.001	0.001	0.001	-	0.004	-
BS98014	Liver	-	-	-	0.0019	<0.0001	<0.0001	-	-	0.001	0.001	<0.0001	-	0.0032	-
BS98016	Kidney	0.0003	0.00004	0.00004	0.0001			0.00004	0.00004	-	-	-	0.0001	-	0.0005
BS98016	Liver	0.0003	0.00004	0.00004	0.0003			0.00004	0.00004	-	-	-	0.0003	-	0.001
BS98019	Kidney	-	-	-	0.0026	<0.0001	<0.0001	-	-	<0.0001	0.0002	0.0003	-	0.0038	-
BS98019	Liver	-	-	-	0.0023	<0.0001	<0.0001	-	-	0.001	0.0004	<0.0001	-	0.0031	-
BS98022	Kidney	-	-	-	0.0024	<0.0001	<0.0001	-	-	0.0011	0.001	<0.0001	-	0.0031	-
BS98022	Liver	-	-	-	0.0014	<0.0001	<0.0001	-	-	0.001	0.0003	-0.0001	-	<0.0001	-
BS98026	Kidney	-	-	-	0.0014	<0.0001	<0.0001	-	-	0.001	0.0003	0.0011	-	0.0029	-
BS98026	Liver	-	-	-	0.0023	<0.0001	<0.0001	-	-	0.001	0.001	<0.0001	-	0.0032	-
BS98028	Kidney	0.0004	0.00005	0.00005	0.0004	-	-	0.00005	0.00005	-	-	-	0.0004	-	0.001
BS98028	Liver	0.0002	0.00004	0.00004	0.0001	-	-	0.00004	0.00004	-	-	-	0.0001	-	0.0003
BS98029	Kidney	-	-	-	0.0034	<0.0001	<0.0001	-	-	0.0035	0.0025	0.0005	-	0.0053	-
BS98029	Liver	-	-	-	0.0055	<0.0001	<0.0001	-	-	0.003	0.0035	<0.0001	-	0.005	-
BS98030	Kidney	-	-	-	0.0005	<0.0001	<0.0001	-	-	<0.0001	0.0005	0.0002	-	0.0036	-
BS98030	Liver	-	-	-	0.0016	<0.0001	<0.0001	-	-	0.0013	0.0003	<0.0001	-	0.0018	-
BS98031	Kidney	-	-	-	0.001	<0.0001	<0.0001	-	-	<0.0001	0.0023	0.0115	-	0.0024	-
BS98031	Liver	-	-	-	0.0018	<0.0001	<0.0001	-	-	0.0015	0.001	<0.0001	-	<0.0001	-
BS98032	Kidney	-	-	-	0.0017	<0.0001	<0.0001	-	-	0.0004	0.001	0.0004	-	0.0038	-
BS98032	Liver	-	-	-	0.0044	<0.0001	<0.0001	-	-	0.0044	0.0048	<0.0001	-	0.0084	-
BS98033	Kidney	-	-	-	0.0015	<0.0001	<0.0001	-	-	<0.0001	0.0002	0.0012	-	0.0021	-

Appendix F4. Continued

Animal ID	MATRIX	PCB # 28	PCB # 29	PCB # 30	PCB # 31	PCB # 32	PCB # 33	PCB # 39	PCB # 41	PCB # 44	PCB # 47	PCB # 48	PCB # 48/4	PCB # 49	PCB # 52
BS98033	Liver	-	-	-	0.0023	<0.0001	<0.0001	-	-	0.0002	0.001	<0.0001	-	0.0032	-
BS98034	Kidney	0.0002	0.00003	0.00003	0.0002	-	-	0.00003	0.00003	-	-	-	0.0003	-	0.0012
BS98034	Liver	0.0002	0.00003	0.00003	0.0001	-	-	0.00003	0.00003	-	-	-	0.0002	-	0.0004
BS98036	Kidney	0.0016	0.00005	0.00005	0.0017	-	-	0.00005	0.00005	-	-	-	0.0004	-	0.0011
BS98036	Liver	0.0003	0.00004	0.00004	0.0003	-	-	0.00004	0.00004	-	-	-	0.0003	-	0.0019
KL96003	Kidney	-	-	-	0.0019	<0.0001	<0.0001	-	-	0.0005	0.001	<0.0001	-	0.0035	-
KL96003	Liver	-	-	-	0.003	<0.0001	<0.0001	-	-	0.0011	0.001	<0.0001	-	0.0039	-
PW96219	Kidney	0.0002	0.00004	0.00004	0.0001	-	-	0.00004	0.00004	-	-	-	0.0002	-	0.0011
PW96219	Liver	0.0002	0.00003	0.00003	0.0001	-	-	0.00003	0.00003	-	-	-	0.0002	-	0.0004
RU98001	Kidney	-	-	-	0.001	<0.0001	<0.0001	-	-	0.001	0.0003	<0.0001	-	0.0021	-
RU98001	Liver	-	-	-	0.0012	<0.0001	<0.0001	-	-	<0.0001	0.0002	<0.0001	-	0.0026	-
RU98002	Kidney	-	-	-	0.0005	<0.0001	<0.0001	-	-	0.0018	0.0005	0.0012	-	0.0032	-
RU98002	Liver	-	-	-	0.0135	<0.0001	<0.0001	-	-	0.0005	0.001	<0.0001	-	0.0034	-
YA96030	Kidney	-	-	-	0.0002	<0.0001	<0.0001	-	-	<0.0001	0.0002	0.0004	-	0.0025	-
YA96030	Liver	-	-	-	0.0015	<0.0001	<0.0001	-	-	0.0013	0.0005	<0.0001	-	0.0025	-

Appendix F5. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in mg/kg (ppm) dry weight basis.

Animal ID	MATRIX	PCB # 53	PCB # 55	PCB # 60	PCB# 61/6	PCB # 66	PCB # 70	PCB # 71	PCB # 72	PCB # 74	PCB # 74/88	PCB # 77	PCB # 8	PCB # 80
140007	Kidney	0.0001	<0.00004	0.0003	<0.00004	0.0016	0.0013	-	<0.00004	0.0010	-	0.0001	0.0002	0.00004
140007	Liver	0.00004	0.00004	0.0001	0.00004	0.0004	0.0003	-	0.00004	0.0003	-	0.00005	0.0001	0.0004
195003	Kidney	-	-	<0.0001	-	-	0.0013	0.0003	-	-	0.0006	0.0006	0.0017	-
195003	Liver	-	-	0.0005	-	-	0.0051	0.0010	-	-	0.0004	0.0004	<0.0001	-
230001	Kidney	-	-	<0.0001	-	-	<0.0001	0.0007	-	-	<0.0001	0.0004	0.0016	-
230001	Liver	-	-	0.0007	-	-	0.0017	<0.0001	-	-	<0.0001	0.0004	<0.0001	-
480002	Kidney	-	-	-	-	-	<0.0014	<0.0014	-	-	-	<0.0014	<0.0014	-
480002	Liver	-	-	-	-	-	<0.0017	<0.0017	-	-	-	<0.0017	<0.0017	-
480014	Kidney	-	-	-	-	-	<0.0015	<0.0015	-	-	-	<0.0015	<0.0015	-
480014	Liver	-	-	-	-	-	<0.0017	<0.0017	-	-	-	<0.0017	<0.0017	-
480015	Kidney	-	-	-	-	-	<0.0021	<0.0021	-	-	-	<0.0021	<0.0021	-
480015	Liver	-	-	-	-	-	<0.0017	<0.0017	-	-	-	<0.0017	<0.0017	-
500001	Kidney	-	-	-	-	-	<0.0023	<0.0023	-	-	-	<0.0023	<0.0023	-
500001	Liver	-	-	-	-	-	<0.0018	<0.0018	-	-	-	<0.0018	<0.0018	-
500003	Kidney	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
500003	Liver	-	-	-	-	-	<0.0017	<0.0017	-	-	-	<0.0017	<0.0017	-
500004	Kidney	-	-	-	-	-	<0.0021	<0.0021	-	-	-	<0.0021	<0.0021	-
500004	Liver	-	-	-	-	-	<0.0016	<0.0016	-	-	-	<0.0016	<0.0016	-
500006	Kidney	-	-	-	-	-	<0.0022	<0.0022	-	-	-	<0.0022	<0.0022	-
500006	Liver	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
500007	Kidney	-	-	-	-	-	<0.0022	<0.0022	-	-	-	<0.0022	<0.0022	-
500007	Liver	-	-	-	-	-	<0.0017	<0.0017	-	-	-	<0.0017	<0.0017	-
500008	Kidney	-	-	-	-	-	<0.0021	<0.0021	-	-	-	<0.0021	<0.0021	-
500008	Liver	-	-	-	-	-	<0.0018	<0.0018	-	-	-	<0.0018	<0.0018	-
500009	Kidney	-	-	-	-	-	<0.0022	<0.0022	-	-	-	<0.0022	<0.0022	-
500009	Liver	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
500010	Kidney	-	-	-	-	-	<0.0021	<0.0021	-	-	-	<0.0021	<0.0021	-
500010	Liver	-	-	-	-	-	<0.0018	<0.0018	-	-	-	<0.0018	<0.0018	-
570004	Kidney	-	-	-	-	-	<0.0009	<0.0009	-	-	-	<0.0009	<0.0009	-
570004	Liver	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
570007	Kidney	-	-	-	-	-	<0.0010	<0.0010	-	-	-	<0.0010	<0.0010	-
570007	Liver	-	-	-	-	-	<0.0016	<0.0016	-	-	-	<0.0016	<0.0016	-
600001	Kidney	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
600001	Liver	-	-	-	-	-	<0.0018	<0.0018	-	-	-	<0.0018	<0.0018	-
600015	Kidney	-	-	-	-	-	<0.0017	<0.0017	-	-	-	<0.0017	<0.0017	-
600015	Liver	-	-	-	-	-	<0.0017	<0.0017	-	-	-	<0.0017	<0.0017	-
650002	Kidney	<0.00004	<0.00004	0.0004	0.0001	0.0016	0.0002	-	<0.00004	0.0012	-	0.00004	0.0001	0.00004
650002	Liver	0.00004	0.00003	0.0001	0.00003	0.0002	0.0001	-	0.00003	0.0002	-	0.00003	0.0001	0.00003

Appendix F5. Continued

Animal ID	MATRIX	PCB # 53	PCB # 55	PCB # 60	PCB# 61/6	PCB # 66	PCB # 70	PCB # 71	PCB # 72	PCB # 74	PCB # 74/88	PCB # 77	PCB # 8	PCB # 80
BS94001	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94004	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94006	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94009	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94010	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94011	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94012	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94016	Kidney	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
BS94016	Liver	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
BS94017	Kidney	-	-	-	-	-	<0.0023	<0.0023	-	-	-	<0.0023	<0.0023	-
BS94017	Liver	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
BS94018	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94018	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS96009	Kidney	0.0001	<0.0001	0.0002	<0.0001	0.0011	0.0003	-	<0.0001	0.0008	-	0.0001	0.0003	0.0001
BS96009	Liver	0.00005	0.00005	0.0004	0.0003	0.0037	0.00005	-	0.00005	0.0029	-	0.0001	0.0001	0.00005
BS96011	Kidney	-	-	-	-	-	<0.0014	<0.0014	-	-	-	<0.0014	<0.0014	-
BS96011	Liver	-	-	-	-	-	<0.0018	<0.0018	-	-	-	<0.0018	<0.0018	-
BS96012	Kidney	-	-	-	-	-	<0.0018	<0.0018	-	-	-	<0.0018	<0.0018	-
BS96012	Liver	-	-	-	-	-	<0.0018	<0.0018	-	-	-	<0.0018	<0.0018	-
BS96013	Kidney	-	-	-	-	-	<0.0019	<0.0019	-	-	-	<0.0019	<0.0019	-
BS96013	Liver	-	-	-	-	-	<0.0016	<0.0016	-	-	-	<0.0016	<0.0016	-
BS96023	Kidney	-	-	-	-	-	<0.0021	<0.0021	-	-	-	<0.0021	<0.0021	-
BS96023	Liver	-	-	-	-	-	0.0048	<0.0017	-	-	-	<0.0017	<0.0017	-
BS96023A	Liver	-	-	<0.0001	-	-	0.0019	0.0001	-	-	-	0.0004	<0.0001	-
BS96023A	Kidney	-	-	<0.0001	-	-	0.0020	0.0006	-	-	-	0.0004	0.0007	0.0009
BS97011	Kidney	-	-	<0.0001	-	-	0.0024	0.0004	-	-	<0.0001	0.0008	0.0014	-
BS97011	Liver	-	-	<0.0001	-	-	0.0023	0.0002	-	-	0.0023	0.0002	<0.0001	-
BS97012	Kidney	<0.00003	<0.00003	0.0002	<0.00003	0.0009	0.0002	-	<0.00003	0.0006	-	0.0001	0.0001	0.00003
BS97012	Liver	0.00003	0.00003	0.0000	0.00003	0.0001	0.0002	-	0.00003	0.0001	-	0.0000	0.0001	0.00003
BS97018	Kidney	<0.00003	<0.00003	0.0005	0.00015	0.0025	0.0002	-	<0.00003	0.0020	-	0.0000	0.0001	0.00003
BS97018	Liver	0.00004	0.00004	0.0001	0.00004	0.0002	0.0002	-	0.00004	0.0002	-	0.0000	0.0001	0.00004

Appendix F5. Continued

Animal ID	MATRIX	PCB # 53	PCB # 55	PCB # 60	PCB# 61/6	PCB # 66	PCB # 70	PCB # 71	PCB # 72	PCB # 74	PCB # 74/88	PCB # 77	PCB # 8	PCB # 80
BS97023	Kidney	-	-	<0.0001	-	-	0.0026	<0.0001	-	-	0.0004	0.0009	<0.0001	-
BS97023	Liver	-	-	<0.0001	-	-	0.0021	<0.0001	-	-	<0.0001	0.0004	<0.0001	-
BS97030	Kidney	-	-	<0.0001	-	-	0.0027	<0.0001	-	-	0.0002	0.0010	<0.0001	-
BS97030	Liver	-	-	0.0002	-	-	0.0028	<0.0001	-	-	0.0007	0.0012	<0.0001	-
BS97036	Kidney	<0.00004	<0.00004	-0.00004	-0.00004	0.0002	0.0002	-	-0.00004	0.0001	-	0.00004	0.0001	0.00004
BS97036	Liver	0.00003	0.00003	0.00003	0.00003	0.0001	0.0002	-	0.00003	0.0001	-	0.00003	0.0001	0.00003
BS97044	Kidney	<0.00004	<0.00004	0.0001	-0.00004	0.0007	0.0004	-	-0.00004	0.0006	-	0.00004	0.0001	0.00004
BS97044	Liver	0.00004	0.00004	0.00004	0.00004	0.0001	0.0002	-	0.00004	0.0001	-	0.00004	0.0001	0.00004
BS97048	Kidney	0.00003	0.00003	0.0002	0.00003	0.00003	0.0011	-	0.0007	0.0008	-	0.00003	0.0002	0.00003
BS97048	Liver	0.00004	0.00003	0.00004	0.00003	0.0002	0.0002	-	0.00003	0.0001	-	0.00003	0.0002	0.00003
BS97057	Kidney	0.0001	0.00004	0.0003	0.00004	0.0011	0.0012	-	0.00004	0.0008	-	0.0002	0.0005	0.00004
BS97057	Liver	0.00003	0.00003	0.00004	0.00003	0.0002	0.0003	-	0.00003	0.0002	-	0.00003	0.0001	0.00003
BS98001	Kidney	0.00005	0.00005	0.0001	0.00005	0.00005	0.0003	-	0.0002	0.0003	-	0.0001	0.0001	0.00005
BS98001	Liver	0.00004	0.00004	0.0001	0.00004	0.0004	0.0002	-	0.00004	0.0003	-	0.00004	0.0001	0.00004
BS98006	Kidney	0.00004	0.00004	0.0002	0.00004	0.0009	0.0004	-	0.00004	0.0007	-	0.0001	0.0001	0.00004
BS98006	Liver	0.00004	0.00004	0.0001	0.00004	0.0003	0.0003	-	0.00004	0.0002	-	0.00004	0.0001	0.00004
BS98014	Kidney	-	-	0.0004	-	-	0.0029	<0.0001	-	-	0.0016	0.0009	0.0011	-
BS98014	Liver	-	-	0.0003	-	-	0.0024	0.0002	-	-	0.0012	0.0003	<0.0001	-
BS98016	Kidney	0.00004	0.00004	0.0001	0.00004	0.0009	0.0001	-	0.00004	0.0006	-	0.00004	0.0001	0.00004
BS98016	Liver	0.00005	0.00004	0.0002	0.00004	0.0008	0.0004	-	0.00004	0.0006	-	0.00004	0.0001	0.00003
BS98019	Kidney	-	-	<0.0001	-	-	<0.0001	<0.0001	-	-	<0.0001	0.0005	0.0012	-
BS98019	Liver	-	-	<0.0001	-	-	0.0009	<0.0001	-	-	<0.0001	0.0004	0.0011	-
BS98022	Kidney	-	-	<0.0001	-	-	0.0010	<0.0001	-	-	0.0005	0.0004	0.0008	-
BS98022	Liver	-	-	0.0005	-	-	0.0015	<0.0001	-	-	0.0017	0.0003	0.0008	-
BS98026	Kidney	-	-	0.0003	-	-	0.0033	<0.0001	-	-	0.0010	0.0125	0.0006	-
BS98026	Liver	-	-	<0.0001	-	-	0.0023	<0.0001	-	-	0.0011	0.0005	<0.0001	-
BS98028	Kidney	0.00005	0.00005	0.0001	0.00005	0.0005	0.0007	-	0.00005	0.0003	-	0.00005	0.0002	0.00005
BS98028	Liver	0.00004	0.00004	0.0000	0.00004	0.0001	0.0002	-	0.00004	0.0001	-	0.00004	0.0001	0.00004
BS98029	Kidney	-	-	0.0011	-	-	0.0029	0.0033	-	-	0.0030	0.0008	<0.0001	-
BS98029	Liver	-	-	0.0014	-	-	0.0046	0.0005	-	-	0.0039	0.0008	0.0009	-
BS98030	Kidney	-	-	<0.0001	-	-	0.0016	<0.0001	-	-	<0.0001	0.0006	<0.0001	-
BS98030	Liver	-	-	<0.0001	-	-	0.0005	0.0002	-	-	<0.0001	0.0002	<0.0001	-
BS98031	Kidney	-	-	0.0016	-	-	0.0156	<0.0001	-	-	0.0035	0.0038	<0.0001	-
BS98031	Liver	-	-	<0.0001	-	-	0.0022	0.0002	-	-	0.0011	0.0007	0.0009	-
BS98032	Kidney	-	-	<0.0001	-	-	<0.0001	<0.0001	-	-	<0.0001	0.0009	0.0006	-
BS98032	Liver	-	-	0.0029	-	-	0.0036	<0.0001	-	-	0.0056	0.0002	<0.0001	-
BS98033	Kidney	-	-	<0.0001	-	-	0.0032	<0.0001	-	-	0.0005	0.0004	0.0010	-
BS98033	Liver	-	-	<0.0001	-	-	0.0014	0.0004	-	-	<0.0001	0.0004	0.0010	-
BS98034	Kidney	0.00003	0.00003	0.0001	0.00003	0.0004	0.0002	-	0.00003	0.0004	-	0.00004	0.0001	0.00003

Appendix F5. Continued

Animal ID	MATRIX	PCB # 53	PCB # 55	PCB # 60	PCB# 61/6	PCB # 66	PCB # 70	PCB # 71	PCB # 72	PCB # 74	PCB # 74/88	PCB # 77	PCB # 8	PCB # 80
BS98034	Liver	0.00003	0.00003	0.0000	0.00003	0.0001	0.0002	-	0.00003	0.0001	-	0.00003	0.0001	0.00003
BS98036	Kidney	0.0001	0.0001	0.0001	0.0001	0.0010	0.0004	-	0.0001	0.0008	-	0.0001	0.0002	0.0001
BS98036	Liver	0.00005	0.00004	0.0005	0.0003	0.0033	0.0028	-	0.00004	0.0027	-	0.00004	0.0001	0.00004
KL96003	Kidney	-	-	<0.0001	-	-	0.0015	<0.0001	-	-	<0.0001	0.0004	0.0021	-
KL96003	Liver	-	-	<0.0001	-	-	0.0011	<0.0001	-	-	<0.0001	0.0005	0.0007	-
PW96219	Kidney	0.00004	0.00004	0.0005	0.0001	0.0027	0.0003	-	0.00004	0.0019	-	0.0001	0.0001	0.00004
PW96219	Liver	0.00003	0.00003	0.0001	0.00003	0.0004	0.0002	-	0.00003	0.0003	-	0.0000	0.0001	0.0004
RU98001	Kidney	-	-	0.0004	-	-	0.0021	<0.0001	-	-	0.0012	0.0006	0.0008	-
RU98001	Liver	-	-	<0.0001	-	-	<0.0001	<0.0001	-	-	0.0016	0.0005	0.0011	-
RU98002	Kidney	-	-	0.0004	-	-	0.0041	<0.0001	-	-	0.0011	0.0009	0.0008	-
RU98002	Liver	-	-	0.0003	-	-	0.0010	0.0001	-	-	0.0005	0.0005	0.0006	-
YA96030	Kidney	-	-	0.0005	-	-	0.0077	<0.0001	-	-	0.0014	0.0011	0.0014	-
YA96030	Liver	-	-	<0.0001	-	-	<0.0001	<0.0001	-	-	0.0008	0.0006	0.0004	-

Appendix F6. Residues of PCB Congeners and Aroclors found in sea otter kidneys and livers. Concentrations reported in mg/kg (ppm) dry weight basis.

Animal ID	MATRIX	PCB # 81	PCB # 84	PCB # 85	PCB # 87	PCB # 88	PCB # 9	PCB # 91	PCB # 95	PCB # 99	PCB 1242	PCB 1248	PCB 1254	PCB 1260
140007	Kidney	0.0001	0.0060	-	0.0030	-	<0.00004	0.0005	-	-	<0.0429	<0.0429	<0.0429	<0.0429
140007	Liver	0.00004	0.0012	-	0.0006	-	0.00004	0.0001	-	-	<0.0361	<0.0361	<0.0361	<0.0361
195003	Kidney	0.0042	-	0.0009	-	-	-	-	0.0024	0.0010	<0.2140	<0.2140	<0.2140	<0.2140
195003	Liver	0.0030	-	0.0001	-	-	-	-	0.0006	0.0005	<0.1680	<0.1680	<0.1680	<0.1680
230001	Kidney	0.0037	-	0.0004	-	-	-	-	0.0041	0.0009	<0.1860	<0.1860	<0.1860	<0.1860
230001	Liver	0.0027	-	0.0001	-	-	-	-	0.0029	0.0001	<0.1840	<0.1840	<0.1840	<0.1840
480002	Kidney	<0.0014	-	-	-	<0.0014	-	-	<0.0014	-	<0.1350	<0.1350	<0.1350	<0.1350
480002	Liver	<0.0017	-	-	-	<0.0017	-	-	<0.0017	-	<0.1720	<0.1720	<0.1720	<0.1720
480014	Kidney	<0.0015	-	-	-	<0.0015	-	-	<0.0015	-	<0.1470	<0.1470	<0.1470	<0.1470
480014	Liver	<0.0017	-	-	-	<0.0017	-	-	<0.0017	-	<0.1720	<0.1720	<0.1720	<0.1720
480015	Kidney	<0.0021	-	-	-	<0.0021	-	-	<0.0021	-	<0.2080	<0.2080	<0.2080	<0.2080
480015	Liver	<0.0017	-	-	-	<0.0017	-	-	<0.0017	-	<0.1720	<0.1720	<0.1720	<0.1720
500001	Kidney	<0.0023	-	-	-	<0.0023	-	-	<0.0023	-	<0.2270	<0.2270	<0.2270	<0.2270
500001	Liver	<0.0018	-	-	-	<0.0018	-	-	<0.0018	-	<0.1790	<0.1790	<0.1790	<0.1790
500003	Kidney	<0.0019	-	-	-	<0.0019	-	-	<0.0019	-	<0.1920	<0.1920	<0.1920	<0.1920
500003	Liver	<0.0017	-	-	-	<0.0017	-	-	<0.0017	-	<0.1670	<0.1670	<0.1670	<0.1670
500004	Kidney	<0.0021	-	-	-	<0.0021	-	-	<0.0021	-	<0.2080	<0.2080	<0.2080	<0.2080
500004	Liver	<0.0016	-	-	-	<0.0016	-	-	<0.0016	-	<0.1610	<0.1610	<0.1610	<0.1610
500006	Kidney	<0.0022	-	-	-	<0.0022	-	-	<0.0022	-	<0.2170	<0.2170	<0.2170	<0.2170
500006	Liver	<0.0019	-	-	-	<0.0019	-	-	0.0019	-	<0.1850	<0.1850	<0.1850	<0.1850
500007	Kidney	<0.0022	-	-	-	<0.0022	-	-	<0.0022	-	<0.2170	<0.2170	<0.2170	<0.2170
500007	Liver	<0.0017	-	-	-	<0.0017	-	-	<0.0017	-	<0.1720	<0.1720	<0.1720	<0.1720
500008	Kidney	<0.0021	-	-	-	<0.0021	-	-	<0.0021	-	<0.2080	<0.2080	<0.2080	<0.2080
500008	Liver	<0.0018	-	-	-	<0.0018	-	-	<0.0018	-	<0.1790	<0.1790	<0.1790	<0.1790
500009	Kidney	<0.0022	-	-	-	<0.0022	-	-	<0.0022	-	<0.2170	<0.2170	<0.2170	<0.2170
500009	Liver	<0.0019	-	-	-	<0.0019	-	-	<0.0019	-	<0.1850	<0.1850	<0.1850	<0.1850
500010	Kidney	<0.0021	-	-	-	<0.0021	-	-	<0.0021	-	<0.2080	<0.2080	<0.2080	<0.2080
500010	Liver	<0.0018	-	-	-	<0.0018	-	-	<0.0018	-	<0.1790	<0.1790	<0.1790	<0.1790
570004	Kidney	<0.0009	-	-	-	<0.0009	-	-	<0.0009	-	<0.0893	<0.0893	<0.0893	<0.0893
570004	Liver	<0.0019	-	-	-	<0.0019	-	-	<0.0019	-	<0.1850	<0.1850	<0.1850	<0.1850
570007	Kidney	<0.0010	-	-	-	<0.0010	-	-	<0.0010	-	<0.1040	<0.1040	<0.1040	<0.1040
570007	Liver	<0.0016	-	-	-	<0.0016	-	-	<0.0016	-	<0.1560	<0.1560	<0.1560	<0.1560
600001	Kidney	<0.0019	-	-	-	<0.0019	-	-	<0.0019	-	<0.1920	<0.1920	<0.1920	<0.1920
600001	Liver	<0.0018	-	-	-	<0.0018	-	-	<0.0018	-	<0.1790	<0.1790	<0.1790	<0.1790
600015	Kidney	<0.0017	-	-	-	<0.0017	-	-	<0.0017	-	<0.1720	<0.1720	<0.1720	<0.1720
600015	Liver	<0.0017	-	-	-	<0.0017	-	-	<0.0017	-	<0.1720	<0.1720	<0.1720	<0.1720
650002	Kidney	0.00004	0.0059	-	0.0018	-	<0.00004	0.0003	-	-	<0.0366	<0.0366	<0.0366	<0.0366

Appendix F6. Continued

Animal ID	MATRIX	PCB # 81	PCB # 84	PCB # 85	PCB # 87	PCB # 88	PCB # 9	PCB # 91	PCB # 95	PCB # 99	PCB 1242	PCB 1248	PCB 1254	PCB 1260
650002	Liver	0.00003	0.0010	-	0.0004	-	0.0000	0.0001	-	-	<0.0328	<0.0328	<0.0328	<0.0328
BS94001	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94004	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94006	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94009	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94010	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94011	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94012	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94016	Kidney	<0.0019	-	-	-	<0.0019	-	-	<0.0019	-	<0.1920	<0.1920	<0.1920	<0.1920
BS94016	Liver	<0.0019	-	-	-	<0.0019	-	-	<0.0019	-	<0.1850	<0.1850	<0.1850	<0.1850
BS94017	Kidney	<0.0023	-	-	-	<0.0023	-	-	<0.0023	-	<0.2270	<0.2270	<0.2270	<0.2270
BS94017	Liver	<0.0019	-	-	-	<0.0019	-	-	<0.0019	-	<0.1920	<0.1920	<0.1920	<0.1920
BS94018	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94018	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94019	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94020	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94021	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-
BS94022	Liver	-	-	-	-	-	-	-	-	-	-	-	-	-
BS96009	Kidney	0.0001	0.0073	-	0.0034	-	0.0001	0.0005	-	-	<0.0524	<0.0524	0.2250	<0.0524
BS96009	Liver	0.00005	0.0279	-	0.0107	-	0.00005	0.0017	-	-	<0.0465	<0.0465	0.5120	0.1580
BS96011	Kidney	<0.0014	-	-	<0.0014	-	-	<0.0014	-	-	<0.1350	<0.1350	<0.1350	<0.1350
BS96011	Liver	<0.0018	-	-	<0.0018	-	-	<0.0018	-	-	<0.1790	<0.1790	<0.1790	<0.1790
BS96012	Kidney	<0.0018	-	-	<0.0018	-	-	<0.0018	-	-	<0.1790	<0.1790	<0.1790	<0.1790
BS96012	Liver	<0.0018	-	-	<0.0018	-	-	<0.0018	-	-	<0.1790	<0.1790	<0.1790	<0.1790
BS96013	Kidney	<0.0019	-	-	<0.0019	-	-	<0.0019	-	-	<0.1850	<0.1850	<0.1850	<0.1850
BS96013	Liver	<0.0016	-	-	<0.0016	-	-	<0.0016	-	-	<0.1560	<0.1560	<0.1560	<0.1560
BS96023	Kidney	<0.0021	-	-	<0.0021	-	-	<0.0021	-	-	<0.2080	<0.2080	<0.2080	<0.2080
BS96023	Liver	<0.0017	-	-	<0.0017	-	-	0.0048	-	-	<0.1720	<0.1720	<0.1720	<0.1720
BS96023A	Liver	0.0031	-	0.0003	-	-	-	0.0022	0.0003	<0.1690	<0.1690	<0.1690	<0.1690	
BS96023A	Kidney	0.0039	-	0.0005	-	-	-	0.0026	0.0008	<0.1970	<0.1970	<0.1970	<0.1970	
BS97011	Kidney	0.0039	-	0.0005	-	-	-	0.0054	0.0010	<0.1930	<0.1930	<0.1930	<0.1930	
BS97011	Liver	0.0022	-	<0.0001	-	-	-	0.0028	0.0001	<0.1450	<0.1450	<0.1450	<0.1450	
BS97012	Kidney	0.00004	0.0032	-	0.0012	-	<0.00003	0.0002	-	-	<0.0344	<0.0344	<0.0344	<0.0344
BS97012	Liver	0.00003	0.0005	-	0.0002	-	0.00003	0.0000	-	-	<0.0340	<0.0340	<0.0340	<0.0340
BS97018	Kidney	0.00003	0.0061	-	0.0023	-	<0.00003	0.0004	-	-	<0.0337	<0.0337	<0.0337	<0.0337

Appendix F6. Continued

Animal ID	MATRIX	PCB # 81	PCB # 84	PCB # 85	PCB # 87	PCB # 88	PCB # 9	PCB # 91	PCB # 95	PCB # 99	PCB 1242	PCB 1248	PCB 1254	PCB 1260
BS97018	Liver	0.00004	0.0007	-	0.0003	-	0.00004	0.0001	-	-	<0.0360	<0.0360	<0.0360	<0.0360
BS97023	Kidney	0.0026	-	<0.0001	-	-	-	-	0.0023	0.0004	<0.2030	<0.2030	<0.2030	<0.2030
BS97023	Liver	0.0031	-	0.0003	-	-	-	-	0.0027	0.0003	<0.1570	<0.1570	<0.1570	<0.1570
BS97030	Kidney	0.0059	-	0.0006	-	-	-	-	0.0027	0.0012	<0.2690	<0.2690	<0.2690	<0.2690
BS97030	Liver	0.0023	-	0.0018	-	-	-	-	0.0031	0.0040	<0.2190	<0.2190	<0.2190	0.4210
BS97036	Kidney	0.00004	0.0005	-	0.0002	-	<0.00004	0.00004	-	-	<0.0357	<0.0357	<0.0357	<0.0357
BS97036	Liver	0.00003	0.0004	-	0.0002	-	0.00003	0.0000	-	-	<0.0312	<0.0312	<0.0312	<0.0312
BS97044	Kidney	0.00004	0.0056	-	0.0018	-	<0.00004	0.0003	-	-	<0.0372	<0.0372	<0.0372	<0.0372
BS97044	Liver	0.00004	0.0010	-	0.0004	-	0.00004	0.0001	-	-	<0.0350	<0.0350	<0.0350	<0.0350
BS97048	Kidney	0.00003	0.0061	-	0.0014	-	0.00003	0.0004	-	-	<0.0290	<0.0290	<0.0290	<0.0290
BS97048	Liver	0.00003	0.0012	-	0.0005	-	0.00003	0.0001	-	-	<0.0318	<0.0318	<0.0318	<0.0318
BS97057	Kidney	0.00007	0.0018	-	0.0012	-	0.00004	0.0003	-	-	<0.0410	<0.0410	<0.0410	<0.0410
BS97057	Liver	0.00003	0.0006	-	0.0004	-	0.00004	0.0001	-	-	<0.0328	<0.0328	<0.0328	<0.0328
BS98001	Kidney	0.00005	0.0008	-	0.0003	-	0.00005	0.0001	-	-	<0.0463	<0.0463	<0.0463	<0.0463
BS98001	Liver	0.00004	0.0010	-	0.0004	-	0.00004	0.0001	-	-	<0.0375	<0.0375	<0.0375	<0.0375
BS98006	Kidney	0.00004	0.0035	-	0.0010	-	0.00004	0.0002	-	-	<0.0405	<0.0405	<0.0405	<0.0405
BS98006	Liver	0.00004	0.0012	-	0.0004	-	0.00004	0.0001	-	-	<0.0357	<0.0357	<0.0357	<0.0357
BS98014	Kidney	0.0033	-	0.0017	-	-	-	-	0.0031	0.0022	<0.2100	<0.2100	<0.2100	<0.2100
BS98014	Liver	0.0022	-	0.0007	-	-	-	-	0.0023	0.0010	<0.1670	<0.1670	<0.1670	<0.1670
BS98016	Kidney	0.00004	0.0035	-	0.0010	-	0.00004	0.0002	-	-	<0.0364	<0.0364	<0.0364	<0.0364
BS98016	Liver	0.00004	0.0015	-	0.0006	-	0.00004	0.0002	-	-	<0.0366	<0.0366	<0.0366	<0.0366
BS98019	Kidney	0.0033	-	0.0003	-	-	-	-	0.0003	0.0005	<0.1980	<0.1980	<0.1980	<0.1980
BS98019	Liver	0.0027	-	<0.0001	-	-	-	-	0.0019	0.0002	<0.1670	<0.1670	<0.1670	<0.1670
BS98022	Kidney	0.0040	-	0.0003	-	-	-	-	0.0028	0.0003	<0.2010	<0.2010	<0.2010	<0.2010
BS98022	Liver	0.0033	-	0.0001	-	-	-	-	0.0015	0.0001	<0.1780	<0.1780	<0.1780	<0.1780
BS98026	Kidney	0.0041	-	0.0008	-	-	-	-	0.0035	0.0014	<0.2160	<0.2160	<0.2160	<0.2160
BS98026	Liver	0.0030	-	0.0004	-	-	-	-	0.0036	0.0007	<0.1660	<0.1660	<0.1660	<0.1660
BS98028	Kidney	0.00005	0.0016	-	0.0010	-	0.00005	0.0001	-	-	<0.0461	<0.0461	<0.0461	<0.0461
BS98028	Liver	0.00004	0.0003	-	0.0002	-	0.00004	0.00004	-	-	<0.0377	<0.0377	<0.0377	<0.0377
BS98029	Kidney	0.0053	-	0.0010	-	-	-	-	0.0077	0.0017	<0.2420	<0.2420	<0.2420	<0.2420
BS98029	Liver	0.0039	-	0.0014	-	-	-	-	0.0084	0.0027	<0.2100	<0.2100	<0.2100	<0.2100
BS98030	Kidney	0.0038	-	0.0005	-	-	-	-	0.0028	0.0006	<0.1910	<0.1910	<0.1910	<0.1910
BS98030	Liver	0.0019	-	0.0003	-	-	-	-	0.0020	0.0001	<0.1610	<0.1610	<0.1610	<0.1610
BS98031	Kidney	0.0047	-	0.0038	-	-	-	-	0.0100	0.0062	<0.1470	<0.1470	0.3240	0.3240
BS98031	Liver	0.0026	-	0.0006	-	-	-	-	0.0033	0.0006	<0.1630	<0.1630	<0.1630	<0.1630
BS98032	Kidney	0.0043	-	0.0004	-	-	-	-	0.0038	0.0005	<0.2540	<0.2540	<0.2540	<0.2540
BS98032	Liver	0.0021	-	0.0104	-	-	-	-	0.0187	0.0147	<0.1990	<0.1990	0.5180	0.2830
BS98033	Kidney	0.0033	-	0.0003	-	-	-	-	0.0020	0.0003	<0.2030	<0.2030	<0.2030	<0.2030
BS98033	Liver	0.0032	-	0.0002	-	-	-	-	0.0032	0.0002	<0.1600	<0.1600	<0.1600	<0.1600

Appendix F6. Continued

Animal ID	MATRIX	PCB # 81	PCB # 84	PCB # 85	PCB # 87	PCB # 88	PCB # 9	PCB # 91	PCB # 95	PCB # 99	PCB 1242	PCB 1248	PCB 1254	PCB 1260
BS98034	Kidney	0.00003	0.0020	-	0.0006	-	0.00003	0.0001	-	-	<0.0294	<0.0294	<0.0294	<0.0294
BS98034	Liver	0.00003	0.0005	-	0.0002	-	0.00003	0.00004	-	-	<0.0347	<0.0347	<0.0347	<0.0347
BS98036	Kidney	0.0001	0.0043	-	0.0019	-	0.0001	0.0003	-	-	<0.0515	<0.0515	<0.0515	<0.0515
BS98036	Liver	0.00004	0.0168	-	0.0066	-	0.00004	0.0012	-	-	<0.0410	<0.0410	0.1760	<0.0410
KL96003	Kidney	0.0039	-	0.0005	-	-	-	-	0.0039	0.0012	<0.1970	<0.1970	<0.1970	<0.1970
KL96003	Liver	0.0046	-	0.0003	-	-	-	-	0.0039	0.0003	<0.1770	<0.1770	<0.1770	<0.1770
PW96219	Kidney	0.00004	0.0049	-	0.0018	-	0.00004	0.0004	-	-	<0.0448	<0.0448	<0.0448	<0.0448
PW96219	Liver	0.00003	0.0010	-	0.0004	-	0.00003	0.0001	-	-	<0.0329	<0.0329	<0.0329	<0.0329
RU98001	Kidney	0.0037	-	0.0012	-	-	-	-	0.0024	0.0017	<0.1830	<0.1830	<0.1830	<0.1830
RU98001	Liver	0.0021	-	0.0004	-	-	-	-	0.0028	0.0006	<0.1790	<0.1790	<0.1790	<0.1790
RU98002	Kidney	0.0045	-	0.0020	-	-	-	-	0.0045	0.0026	<0.1870	<0.1870	<0.1870	<0.1870
RU98002	Liver	0.0033	-	0.0009	-	-	-	-	0.0034	0.0011	<0.1740	<0.1740	<0.1740	<0.1740
YA96030	Kidney	0.0033	-	0.0013	-	-	-	-	0.0040	0.0024	<0.1670	<0.1670	<0.1670	<0.1670
YA96030	Liver	0.0003	-	0.0004	-	-	-	-	0.0025	0.0005	<0.1660	<0.1660	<0.1660	<0.1660

